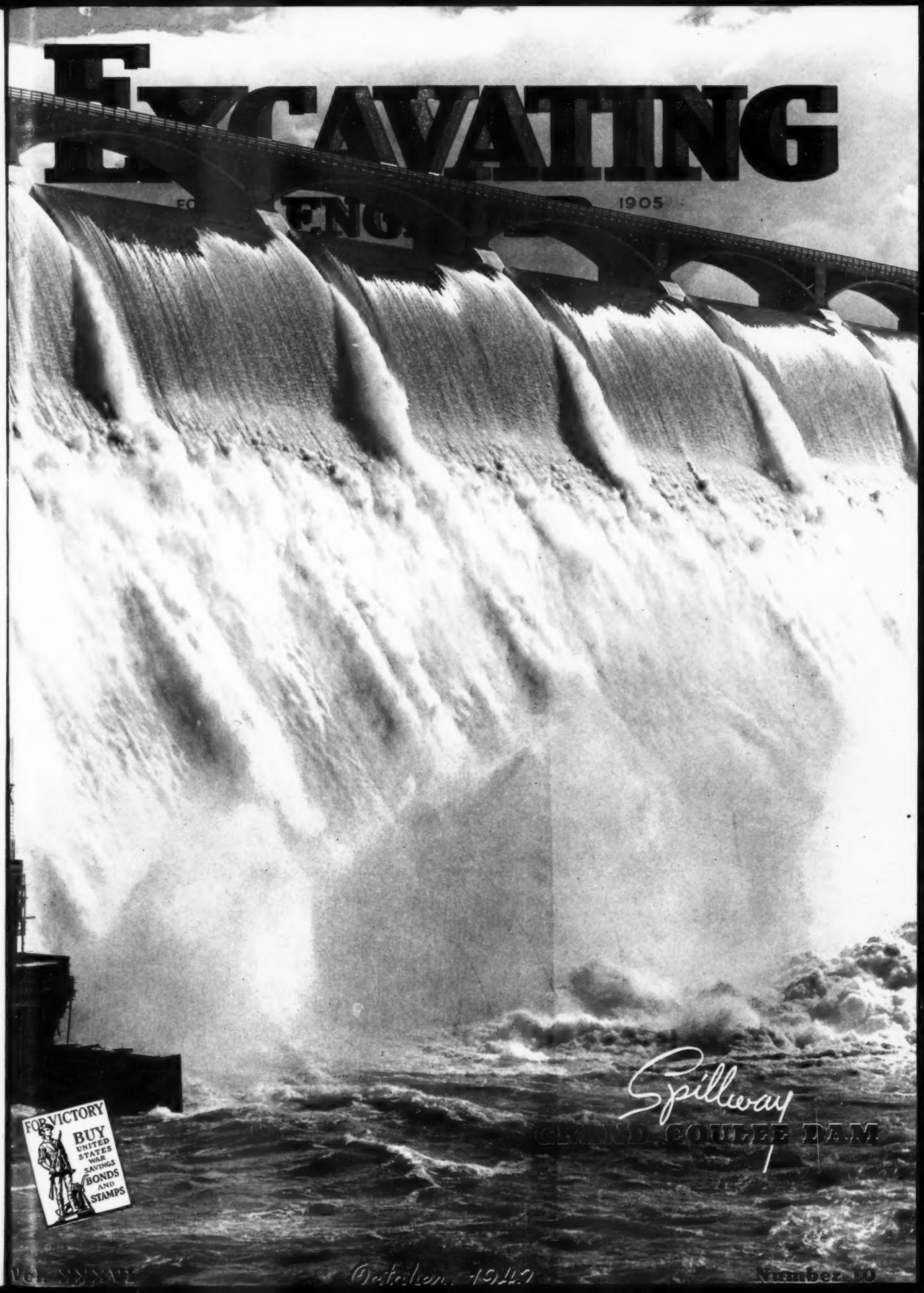
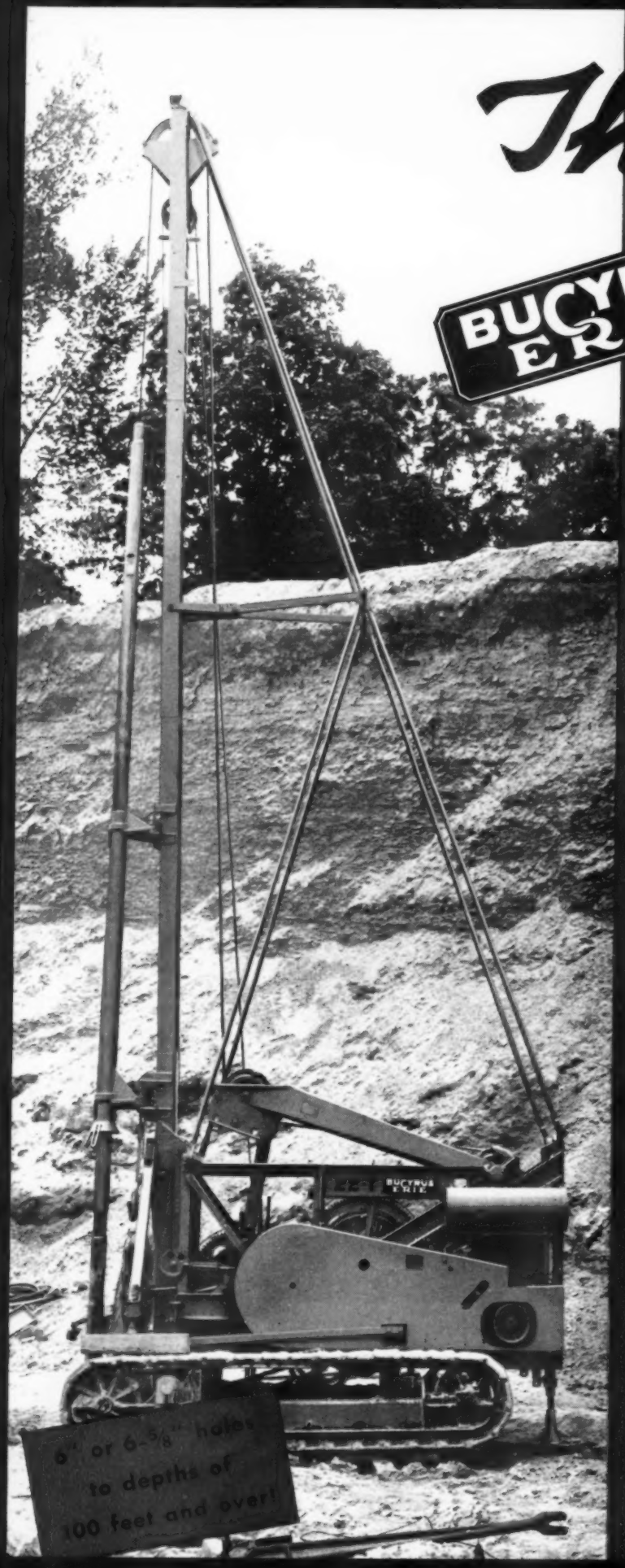
EXCAVATING

ENGINEER 1905



Spillway
GRAND COULEE DAM

Vol. XXXVI October, 1942 Number 10



The NEW BUCYRUS ERIE 22-T

SELF-PROPELLING BLAST-HOLE DRILL WILL LOWER YOUR DRILLING COSTS

Designed to drill 6-in. or 6-5/8-in. holes to depths of 100 feet and over with utmost economy, this new Bucyrus-Erie 22-T gives you the shattering blows, high drilling speed, complete mobility, exceptional cable economy, and other cost-saving advantages of the larger modern blast-hole drills.

A few of its many modern features include: all-steel, all-electric-welded, box-type frame and spudding beam; all-steel, rigidly braced derrick; rubber shock absorber to give snap to line and protect machinery from vibration; wide, full-length crawler mounting with all-welded frame and pivoting axle for easy travel; and a choice of gasoline or electric power unit to suit conditions on your job.

These low-cost, modern 22-T's offer small or medium-sized quarries, cement plants, and contractors the same unexcelled performance that has made Bucyrus-Erie blast hole drills such popular machines in large quarries and mines all over the world.

BUCYRUS-ERIE CO.

SOUTH MILWAUKEE, WISCONSIN, U.S.A.

EXCAVATING ENGINEER

FOUNDED 1905

contents

Vol XXXVI **October, 1942** No. 10

October Advertisers

Allis-Chalmers Manufacturing Company 509
American Chain & Cable Company .....3rd Cover
Buckeye Traction Ditcher Co.. 499
Bucyrus-Erie Company...2nd Cover, 494, 511, 520, 524-525
Bucyrus-Monighan Company .. 531
Buda Company, The..... 493
Caterpillar Tractor Company 4th Cover
Differential Steel Car Co..... 495
Ensign-Bickford Company, The. 496
For Sale (Classified) 535, 536
Gatke Corporation 527
General Electric 498
Haiss Manufacturing Company, George 534
Hayward Company, The 520
Hercules Powder Company ... 513
Independent Pneumatic Tool Co. 514
Ingersoll-Rand Company 489
International Harvester Co. .. 521
Koehring Company 490
Leschen & Sons Rope Co., A... 533
Le Tourneau, R. G. 497
Macwhyte Company 515
Northwest Engineering Company 523
Owen Bucket Company 518
Roebling's Sons Co., John A. .. 507
Rogers Brothers Corporation .. 534
Sauerman Brothers 520
U. S. War Savings Bonds 519
Universal Crusher Company ... 492
Timken Roller Bearing, The... 493
Wellman Engineering Co., The 516

Ex-Laffs 492

Ninety-Day Shipyard—By Will Williams 500

W. A. Bechtel Company transforms a West Coast mud flat into a modern "assembly line" shipyard in record time with shovels and scrapers.

Keep Your Arc Welders Welding—By R. F. Wyer 502

These days of getting the most out of your equipment have made the arc welder an important tool. Here are some tips on maintenance by a General Electric engineer.

Consolidated Rock Ups Production—By Floyd Suter Bixby .. 504

The answer to Consolidated Rock Company's increased production problem was a five-yard electric shovel and the enlargement of a surge hopper to assure continuous flow of materials.

Meet the "Seabees" 506

Some interesting information on the origin and personnel of the Navy's seagoing construction battalions.

Equipment You Ought to Know About 508

Automatic Vise 508
Pulverizer Hammer 508
Belt Idler 508
Fire Extinguisher Cabinet.. 508
Welder Trailer 508
Tire Lock 508

Shots From the Firing Line 510

All Trucks Must Be Registered by Nov. 15..... 510
WPB Orders Nationwide Equipment Inventory ... 510
War Construction Continues in Record Volume 512
Inventory Your Man Power Now 512
U. S. Engineers Establish Equipment Pool 514
Phosphate Rock Production 516
Electronic Tubes Control Utah Tunnel Traffic 516
States Enforce Speed Control 518
WPB Road Construction Equipment Figures 518
Rosoff Contracts for Mexican Irrigation Job 520
Safety Congress Convenes.. 520
Sees Danger in States Acquiring Local Roads .. 520

Obituary 512

Horace Lyle Hudson

Not in the Contract 522

Notes from the Manufacturers 534

New Trade Literature 535

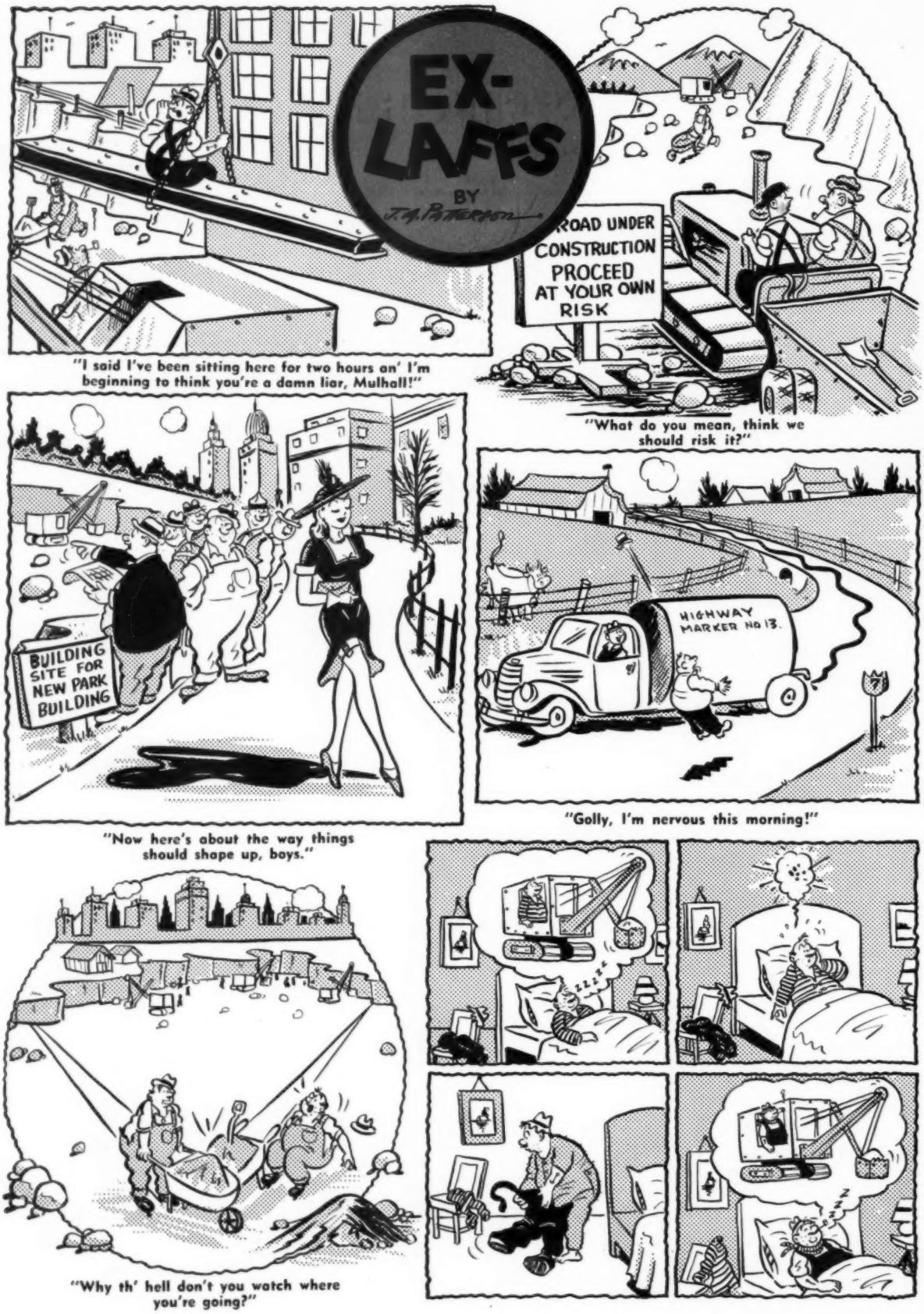
Published Monthly by THE EXCAVATING ENGINEER PUBLISHING COMPANY, South Milwaukee, Wisconsin, U.S.A.

F. O. WYSE, *Manager* — ARNOLD ANDREWS, *Assistant Manager*
D. B. REED, JR., *Editor* — M. J. BARGENQUEST, *Associate Editor*
JOHN L. MORAVEC, *Art Director* — DELMAR COHEN, *Assistant Editor*
E. M. HEUSTON, *Sales Manager* — E. F. BRIESEMEISTER, *Assistant Editor*

CCA Member Controlled Circulation Audit

Regular subscription: 25 cents per copy, $2.50 a year; Canada, subject to publication policy, $3.50 per year. Special subscription: Upon application on card inserted in this number this publication will be sent frequently (not regularly) free of charge, to companies, executives and supervisors engaged actively in the industry of excavation.

COPYRIGHT 1942 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY



"I said I've been sitting here for two hours an' I'm beginning to think you're a damn liar, Mulhall!"

"What do you mean, think we should risk it?"

"Now here's about the way things should shape up, boys."

"Golly, I'm nervous this morning!"

"Why th' hell don't you watch where you're going?"

ANOTHER JOB MADE *Easy!*

With BUCKEYE CABLE CONTROL, YOUR TRACTORS CAN DO MORE JOBS!

by BUCKEYE CABLE CONTROL

FASTER, easier, lower cost handling of pipe—that's what the Ohio Fuel and Supply Company secured when they designed and built the rig illustrated. A double drum medium duty Buckeye Power Control Unit made it possible, provided fast, powerful, smooth Cable Controlled operation.

Buckeye Hoists are the logical choice for a job like this. With a Buckeye single or double drum hoist you have one or two lines instantly available for operating dozers, scrapers, rippers, pavement breakers, for hoisting and elevating, pulling out stumps, towing, pulling cable through conduits and for 101 other jobs as well. They make handy men of your tractors, broaden their range of uses so that you can do more jobs, speed up operations and release manpower.

Smooth, cushioned clutch and brake action, cool operation, fingertip control, instantaneous response, ruggedness and dependability are a few of the features Buckeye Hoists offer. Write today for full information and prices on the models for your tractors. You'll be glad you did.

Ask for data on Buckeye UNITILT Bulldozers, Trailbuilders and Pushdozers

•

BUCKEYE TRACTION DITCHER COMPANY
Findlay • Ohio

•

Built by Buckeye

Convertible Shovels

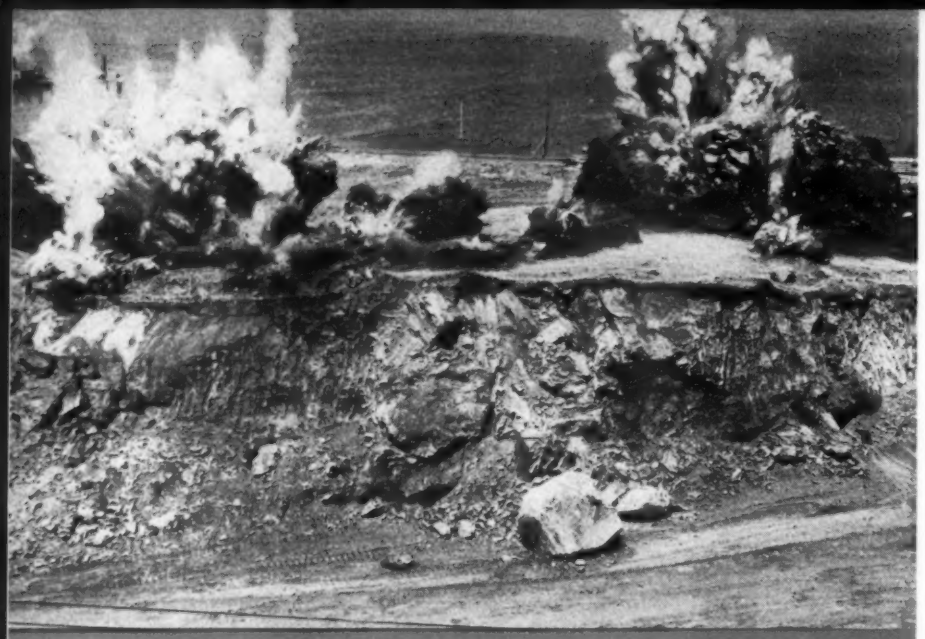
Trenchers

Tractor Equipment

R-B Finegraders

Road Wideners

Spreaders



• A portion of the 784,698 yards of earth that were removed to level Pine Hill are caught in mid-air in this striking action picture.

EXCAVATING ENGINEER • OCTOBER 1942

90-Day Shipyard

W. A. Bechtel Company transforms a West Coast mud flat into a modern "assembly line" shipyard in record time with shovels and scrapers

By WILL WILLIAMS

Photos By Marinship

THREE MONTHS from mud flats to shipyard!

That's the construction record of the new Marinship shipyard in Sausalito, California, which was built by the W. A. Bechtel Company.

The removal of 835,927 cubic yards of dirt from the shipyard site was an important part of the contract which called for the leveling of a few hills, the blasting of a small peninsula out of existence, and general man handling of the local geography.

The new shipyard is to be a model in every respect, incorporating the best results of lessons learned in previous shipbuilding efforts of some of the same Six Companies group of western contractors who built Boulder Dam. It will be one of the finest shipyards in San Francisco Bay area.

Early in '42 it was just a plan on paper. Today ships are being built. The plan was laid out in accord with the new streamlined pre-fabrication and sub-assembly technique of building ships. That means the shipyard is essentially a mile long assembly line laid out along the Sausalito shore.

Assembly Line Methods

There are to be six ways and accommodation for six more ships at the outfitting docks; so Marinship can be working on twelve ships at one time, according to W. E. Waste, general manager. Mr. Waste, who was brought to Marinship from the California Shipbuilding Corporation in Los Angeles, believes the new yard is about ideal in size for the type of ship being built.

To the U. S. Maritime Commission the Sausalito shipyard location was a "dream site." But it took a little heavy shovel work, blasting, filling of slough land and driving of piles to make the dream come true.

• Men and machines construct gantry piers, ways and sub-assembly buildings for Marinship on the level site where Pine Hill once stood.

Like a factory assembly line, the yard is so laid out that materials flow in one direction. The steel is brought by train to one end of the yard. From the storage racks it is taken to shaping shops, and thence by crane to sub-assembly shops. The sections are lowered into place in the ways by huge cranes; and then the sections are welded together. Revolving cranes which lift 50 and 60 tons of steel at a crack speed the flow of materials.

That is the layout for mass production of ships. It is a layout which requires a long stretch of level ground along the bay shore. And the foundations must be solid.

• General excavation view of the Pine Hill levelling operations showing the work in its final stages. In the foreground a 1¾-yard Northwest loads trucks while LeTourneau and Caterpillar scraper-tractor units are at work in the background. N. M. Ball & Sons subbed the major excavation work for W. A. Bechtel Co.

The site chosen by Bechtel's surveyors, engineers, and shipbuilding experts for the new Marinship yard was a mile strip of marsh land two miles northwest of Sausalito, just across the Golden Gate Bridge from San Francisco.

It was on March 28 of this year that the Maritime Commission gave the go-ahead signal to the W. A. Bechtel Company for construction of the Marinship yard. Immediately, an army of contractors, subcontractors, and workers went into action.

Dirt removal work and filling was done by N. M. Ball and Sons under sub-contract with Bechtel. The rolling terrain and scarcity of level land made a good deal of excavation necessary. Along the shore there was nothing but marsh. Fill material was obtained by shaving off the surrounding hills.

First, 32 dwellings were removed from Pine Hill by demolition and house moving crews. The hill was cut down on one side while the houses were being moved. The loads of shale were deposited by 1¾-yard Northwest shovels, into the mudflats.

Piledrivers followed with piles driven from 70 to 150 feet deep. Final completion of the ground-work is being followed by a channel dredging job that will come to about 3,107,000 cubic yards.

As the result of fill placing operations the inboard area now amounts to approximately 66 acres. The yard is one-eighth of a mile wide now as the result of filling in the tideland strip along the bay. Some 4,844,000 square feet of land area is involved.

Removing Pine Hill

What used to be Pine Hill is just a memory now after being removed by blasting and tractor-towed scrapers. When the earth moving equipment had finished levelling the hill it was moved across the highway where a fifteen acre marsh was filled in as a site for the Marinship training school for welders and shipfitters. They then moved on down the highway to Waldo where more marsh land was filled in for the future site of a 2,700 unit project of the Housing Authority of Marin County and the Federal Public Housing Authority. In this latter job it is estimated that nearly half a million cubic yards of earth will be moved.

Speed has been the watchword at the Marinship yard from the beginning. N. M. Ball and sons started actual work on the first big job of conditioning the shipyard site March 28. The job was finished on June 15, nearly a month ahead of the schedule date of July 11. This was done in spite of the fact that two weeks were lost on account of heavier than normal spring rains.

In addition to the residences on Pine Hill, five old shops of the Northwestern Pacific Railway had to be moved. Tracks of the railroad itself had to be re-routed.

From Pine Hill, 784,698 cubic yards of earth were removed. Another 39,280 cubic yards were

(Continued on page 526)

• A General Electric 400-amp motor-generator arc welder is used to repair a stripping shovel in the Clinton pit of The Electric Shovel Coal Corporation, Indiana. Note wheel mounting for portability.

Keep Your Arc

These days of getting the most out of your equipment have made the arc welder an important tool. Here are some tips on maintenance by a General Electric engineer.

By R. F. WYER

Welding Engineer, General Electric Co.

WHILE ARC welding sets today represent the highest in simplicity and reliability, they still require periodic attention from a maintenance standpoint if they are to be kept in the best operating condition.

With the accent on production in mines, quarries, and on war construction projects all over the country, welding sets are doing an important job in thousands of maintenance shops. Their daily maintenance services and emergency repair ability are important factors in keeping irreplaceable dirt moving equipment in trim for the duration. At this time a systematized maintenance program that will pay dividends in terms of better welder performance and longer life is of double importance.

First, if your priority gives you a choice, the right welding set must be selected for the job, because a maintenance program will be discouragingly difficult if misfit equipment is being used.

To insure proper choice of the rating of a single-operator set, the maximum current, load voltage, and duty factor (ratio of arc time to total time) must be taken into account. Except in the smallest sizes, most sets are rated on a one-hour load. Their rating is the current which they will deliver for one hour without interruption, without exceeding a prescribed temperature rise.

Since this method of rating, chosen as a simple standard for comparison, does not take into account actual operating conditions, it is not always economically sound to choose the size next larger than the maximum operating current contemplated. However, for this same reason duty factor should be taken into account when new equipment is being considered to make certain that the set is big enough for the job.

Welder Installation

Proper installation can do much to keep the welding equipment at work and troubles to a minimum. In wiring up a welding set, care should be taken to provide adequate branch circuit conductors, and fuse clips large enough to accommodate the necessary fuses. It should be observed that motor-generator type welding equipments have full-voltage motor starters almost without exception, so that due consideration must be given to the starting current of the motors.

Care should be taken to ground the frames of all welding equip-

• Manufacturers' instructions regarding lubrication of bearings should be carefully noted and followed. Too much grease is just as harmful as too little.

• Ohio State's highway department employs this arc welder unit for the welding of pipe fixtures for road equipment, maintenance of shop tools, scrapers, shovels, plows, cinder spreaders, and other department equipment.

r elders Welding

ments in order to avoid shock or annoying tickles when a grounded person touches the frame of the equipment. Even with equipment in perfect operating condition, under some conditions it is possible to receive a harmless but irritating sensation of shock from ungrounded equipment due to the passage of infinitesimal capacity or leakage currents. In addition to protecting against this annoyance, adequate grounding of machine frames is also a desirable safety precaution against harm resulting from insulation failure in equipment or leads, or improper connections.

Regardless of the type of safety ground connection which is installed, adequate low resistance work leads should always be used, and care should be taken to secure good connection between the work lead and the work. If this is not done, it is possible under some circumstances to overheat the safety ground connection by the passage of welding current through it.

In the location of welding equipment, ventilation is a very important consideration. The life of electrical insulation is seriously shortened by overheating, and overheating is bound to result where insufficient ventilation is provided. Particularly where large numbers of welding equipments are to be located in small enclosures, considerable study should be given to the problem of supplying clean, cool ventilating air. Where small houses or temporary sheds are located in hot sunshine, the heat absorbed from the sun added to the heat dissipated by the welding equipments may raise the ambient temperature above 100°F and cause severe overheating. In such cases, large louvers or other ventilating openings should be provided in the building not only at the bottom but near the roof to give good air circulation and keep the ambient temperature below 100°F. In some instances, it is desirable to provide exhaust fans to assist in removing heated air from the upper part of such enclosures.

Inspection and Regular Servicing

The competent maintenance man will have a record of all welders under his care. One of the most useful and easy-to-handle references is a card file. All repair work, with its cost, can be entered on the record, and any welder requiring excessive attention or expense can be investigated and causes determined and corrected.

Inspection records will also serve as a guide to tell when welders should be replaced because of the high cost to keep them in operating condition. Misapplications, abuses, and the like will also be disclosed.

A systematic and periodic in-

(Continued on page 529)

• If dust conditions are extreme, motor and generator should be blown out with dry compressed air at about 25 to 30 pounds pressure as often as needed.

Consolide

• General operations view of Consolidated Rock Company's gravel pit. Note the dragline and shovel in the background working a 110-foot bank.

The answer to Consolidated Rock Company's increased production problem was a five-yard electric shovel and the enlargement of a surge hopper to assure continuous flow of materials

By
FLOYD SUTER BIXBY

IN SOUTHERN California, the land of exceptions to the rule, there exists an enterprise that has been on the rocks for 34 years. Despite the popular belief that such a business generally fails, this one continues year after year, performing a useful service to the Los Angeles territory. War, and the end of the mid-30 depression has not changed its literal "on the rocks" foundation one bit; the demand for its product has in fact increased.

What does such a plant produce? Why, ROCKS, of course!

Wherever you see the big orange-colored delivery trucks of the Consolidated Rock Company you see the results of this business. You may see their trucks in Los Angeles, San Bernardino, or any other point within a 100 mile radius. It may be a highway job, an aircraft factory, a dam or even a modest house foundation, if it is in a defense housing zone where building is still permitted. For Consolidated is in the rock business, and when they say "rock" they mean orders running into thousands of tons, over a dozen sizes, and all the accurate control that goes into the production of a million tons of aggregate a year.

Choosing the Pit Location

Thirty-four years ago Consolidated opened up a huge tract of land in Big Tujunga Basin below San Fernando. Here, the gravel was well graded. It ranged from 14-inch boulders down to the finest of plaster sand. The deposit was at least 100 feet thick, ground water was at a low level and not very much topsoil had to be stripped to begin producing commercial aggregate. It was a naturally perfect screening site.

In those early days the survey of a material deposit took quantity more than anything else into consideration. Sieve analyses, accelerated soundness tests and screen manipulation technique were not developed to the extent they are today. That is why many of the production sites of a quarter of a century ago have long since been condemned by concrete engineers; the material simply will not meet rigid specifications.

Call it luck or what you will, the Consolidated deposit at Roscoe panned out favorably over the years. All those secrets of laboratory control were considered in advance and solved by the Master who put the deposit where it is. Today, after 34 years, there is a tremendous hole in the ground covering 160 acres, but the commercial deposit still holds out and meets the most rigid federal re-

ded Rock Ups Its Production

quirements for high strength concrete, asphaltic concrete, filter bed rock, and so on.

At the present time Consolidated Rock Company is digging, conveying, screening, washing and delivering about an even million tons of rock a year at a base production price of 75 cents per ton plus delivery cost. At least ten dependent machines are involved. The material is moved 2,140 feet and lifted 140 feet to the plant before it is screened. Consider these factors of price and problem and you have a healthy respect for these producers.

The pit run alluvium of the Roscoe deposit is not cemented, but it is extremely stable and will not cave. Almost every ton coming out of the place has to be dug with a power shovel. Some years back company officials arrived at the ultimate scheme of removing the raw aggregate, and all their present day modernization methods work in toward the fulfilment of that basic objective.

The pit was dug as deep as economy would permit excavation to go, which in this case is controlled by ground water depth and the lift in transporting the raw material up to the plant. This placed the floor of the pit just 110 feet below the top of the bank, and all material is loaded now from the toe of the 110-foot bank. One railroad type Bucyrus-Erie 3-yard steam rig saw many years of service in that operation. It was converted later to electric operation and with a 2-yard Marion was used against the toe, one on either side of the primary hopper, dumping the alluvium in to start it on the journey up the conveyor belt to the screening plant.

Solving Production Problems

The war, coupled with defense work prior to December 7th, 1941, imposed many abnormal demands on the Roscoe plant. Company officials decided to modernize this vital raw supply source, for all the rest of the plant was geared for high speed, quantity production. They decided to buy a single high capacity shovel that would guarantee production through the war, and to increase the size of the secondary storage hopper, since continuous operation of the big plant depended entirely upon this surge pile availability.

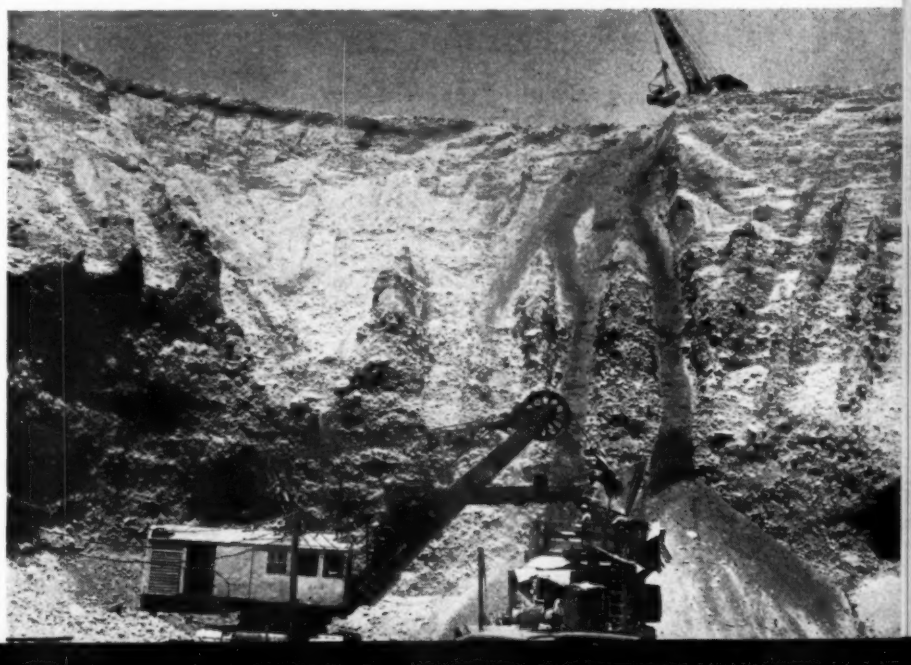
An electric Bucyrus-Erie 120-B shovel, carrying a 5-yard Amsco dipper, was brought in from Redding, California, where it had seen service in rock excavation on Shasta Dam. The machine operates electrically off a 3-phase power line suspended on poles. The shovel was walked in through rough terrain, and spotted against the high bank.

The 120-B had not made a dozen swings until it was apparent to everyone that the feeding hopper would have to be enlarged. While the hopper was large enough to accommodate the three-cubic yards dropping out of the dippers on the old machines, five full yards falling off the business end of the new Bucyrus-Erie was a different story. The primary feeder was therefore increased to accommodate the 120-B's output.

Since the continuous operation of the plant is dependent upon the 120-B, the conveyor belt and motors, it was desirable to set aside a large reserve stock of raw material to feed the screening plant in case the digging or conveying machines are down for short periods of time. The size of the surge pile was therefore increased to 15,000 tons a short time before the 120-B machine was brought in. About 15,000 tons will run the screening plant for three full days if the need ever arises, and the creation of this big reserve has been one of the main steps which now guarantees continuous operation.

The present working schedule utilizes a definite system, which is followed closely. The 120-B digs and loads an average of 3600 tons of aggregate per 8-hour day, working at the base of the 110-foot face. A Koehring ¾-yard machine is used to dislodge material from the excavation face to prevent overhang. This machine uses a 1-yard open end Esco bucket on a 50-foot boom. The Koehring is spotted with crawler tracks parallel to the face and about 15 feet back of the drop off point. The material is so firmly packed that the operators have to use unusual care in their procedure. If more

(*Continued on page 527*)



• Closeup of the digging end of the company's gravel production system. Material loosened by the open end bucket swung from the Koehring dragline on top of the bank is loaded to the conveyor hopper by a Bucyrus-Erie electric shovel equipped with a 5-yard Amsco dipper.

Meet the "SEABEES"

Some interesting information on the origin and personnel of the Navy's seagoing construction battalions

• This angry, sailor-capped bee equipped with sub-machine gun, wrench and hammer is the official insignia of the "Seabees" who acquired their name from the Navy designation of CB or construction battalion. (Official U. S. Navy Photograph.)

FIRST CLASS Petty Officer ratings are now being offered by the U. S. Navy to an indefinite number of workmen experienced in excavation work who are desirous of joining the "Seabees," recently formed naval construction regiments.

These regiments, now located at advance and mobile bases at many points outside the continental limits of the United States, are among those playing an important part in the winning of the United Nations' struggle for peace and freedom.

Base pay for equipment operator ratings will be $114 and with allowances this pay will net approximately $170 per month, exclusive of clothing, food, lodging and transportation. The following are eligible for First Class Petty Officer ratings: shovel operators, bulldozer operators, scraper operators, crane operators, dragline and clamshell equipment operators, truck drivers and other equipment operators experienced in dirt moving. Men who have had experience on dredges and other types of waterfront equipment are also qualified for enlistment in the Navy's construction battalions.

Original "Seabees"

This new branch of the naval service is fast expanding and will continue to grow for months to come. Started in October, 1941, when one company of 99 men was formed as a nucleus of the group whose job is to build the bases so essential for successful prosecution of war, the "Seabees" soon proved their worth.

Two months later five additional companies were formed, designated primarily for utilization as administrative units by the Officer - in - Charge of construction where work was being done by contractors with civilian labor. Their usefulness in this work was soon apparent.

Last December, one construction regiment of approximately 3,300 officers and men was authorized and recruiting was under way in January, 1942. All applications for enlistment were first approved with regard to the technical qualifications of the applicant at one of the five recruiting districts. Professional qualifications corresponded to the trade of the individual applicants.

The first battalion of the first regiment started its training on January 26, 1942. One group was sent to the Naval Air Station, Quonset Point, Rhode Island.

These qualified men, enlisted from dozens of skilled trades, were enrolled in Class V-6 of the Naval Reserve with ratings ranging from Seaman, second class, to Chief Petty Officer. They were given normal base pay, allowances and chances for promotion. These same regulations and opportunities exist today for all experienced construction equipment men.

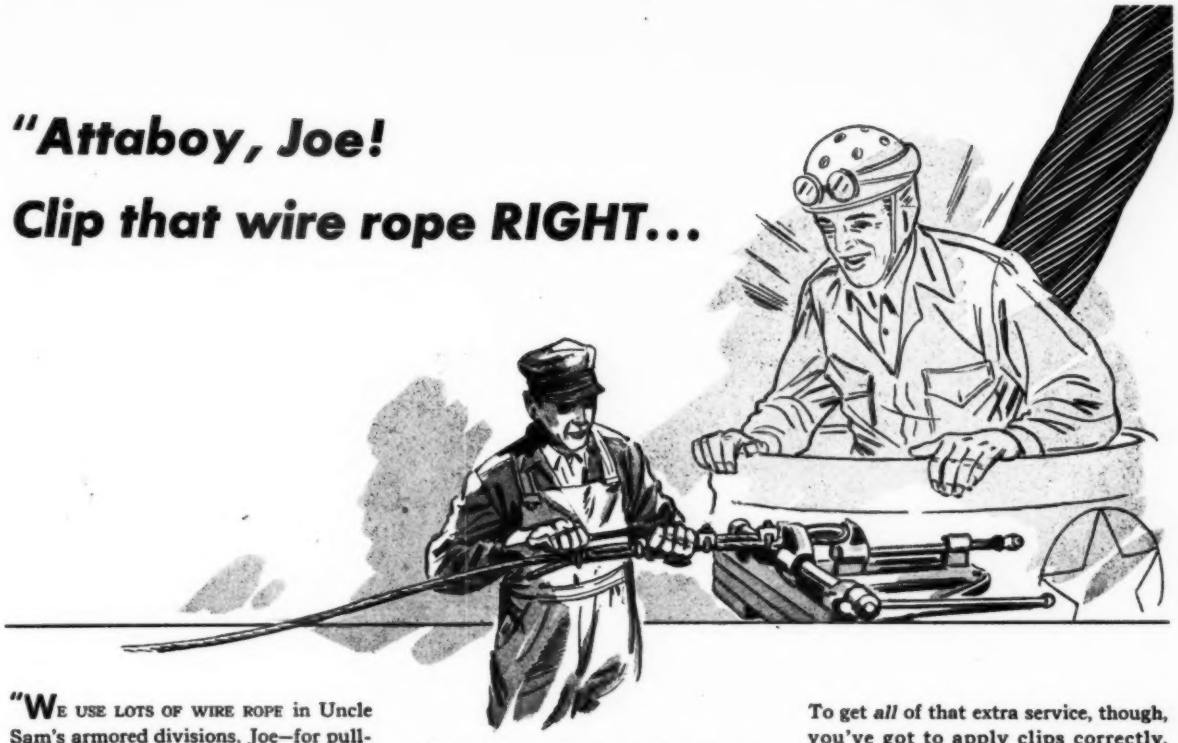
The "Seabees," in paving the way for Uncle Sam's sailors and marines, constitute one of the most important and necessary branches of the U. S. Navy. They have occupied and built fortifications in territories which, but for them, might have already become easy enemy stepping stones to the shores of America. "Seabees" are also trained for engagement in action with the enemy when the occasion arises.

A closely knit body under command of officers of the Civil Engi-

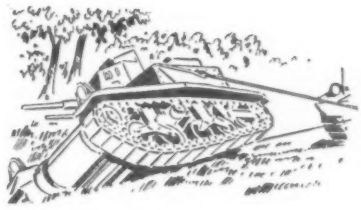
(*Continued on page 527*)

• A cofferdam for a concrete seaplane launching ramp is constructed by the "Seabees" as part of their job of building a naval base on some South Pacific island. (Official U. S. Navy Photograph.)

"Attaboy, Joe!
Clip that wire rope RIGHT...



"WE USE LOTS OF WIRE ROPE in Uncle Sam's armored divisions, Joe—for pulling out of tight spots, for towing disabled tanks and trucks, for handling heavy replacement parts . . . And we use it right and *fasten* it right, because we know men's lives in battle may depend on its being just as strong as it's supposed to be!"



Keeping wire rope "just as strong as it's supposed to be" is important *wherever* wire rope is used—on fighting front or production front! One factor in rope strength is correct fastening. *Properly used,* clips make a convenient and satisfactory fastening, developing 75 to 90 per cent of the rope strength.

When we build "Blue Center" Steel Wire Rope here at Roebling, we put in all the *extra* value of 100 years of wire-rope engineering. But even "Blue Center" Steel Wire Rope can't give extra service unless *enough* clips are used in fastening. The table below gives data for clipping "Blue Center" Wire Rope.

NUMBER OF CLIPS REQUIRED FOR "BLUE CENTER" STEEL WIRE ROPES

Rope Diameter	Number of Clips	Spacing of Clips	Length of Wrench
1/2" to 5/8"	4	3 1/2" to 4 1/4"	12"
3/4" to 7/8"	5	5" to 5 3/4"	18"
1" to 1 1/8"	6	6 1/2" to 7 1/4"	24"
1 1/4" to 1 3/8"	7	8" to 8 3/4"	24"
1 1/2"	8	9 1/2"	24"

To get *all* of that extra service, though, you've got to apply clips correctly. Always use a standard wire-rope thimble. Put the clip U bolts on the dead end of the rope. Tighten bolts securely, but *do not crush rope!* Retighten all clips after an hour's full

running time and also at all regular inspections. By following these rules for proper clipping, you'll be helping to keep rope on the job for Victory.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

★ PROMPT SERVICE
★ on essential orders
★ from warehouse
★ stocks or mill

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

IRON AND STEEL ARE DESPERATELY NEEDED!
Throw Your Scrap Into the FIGHT!

For your convenience in writing to John A. Roebling's Sons Co., you will find a card bound in this issue.

Equipment you ought to KNOW ABOUT

For further details about the equipment on this page please write to the manufacturer, mentioning Excavating Engineer.

Automatic Vise

Manufacturer: Studebaker Machine Company, Chicago, Illinois.

Claims: Entirely foot controlled and hydraulically operated, this new vise permits the use of both hands in the operation, set-up and removal of work from the machine on which it is mounted. The unit is ideally adapted for hun-

dreds of machine shop uses having a per square inch pressure between the jaws in excess of 10,000 pounds. The tool consists of a conventionally-shaped drill press vise without the usual screw and is connected by a 6-foot length of flexible tubing to a hydraulic foot control base.

Pulverizer Hammer

Manufacturer: American Manganese Steel Division of The American Brake Shoe & Foundry Company, Chicago Heights, Illinois.

Claims: This new design has six distinct advantages: great saving in weight of discarded parts; two-thirds of hammer head can actually be used up before removing is necessary; time consumed in removing old and replacing new head is negligible; no operating stress is imposed on shank bolt used for assembling; head cannot work loose and come off arm as long as the latter is on the supporting rotor pin; and no metal is lost by too early discarding of heads.

Belt idler

Manufacturer: Chain Belt Company, 1600 West Bruce Street, Milwaukee, Wisconsin.

Claims: A new self-aligning idler for flat conveyor belts which will help to keep the belt central on its supporting idlers, important for longest possible life from a conveyor belt. The operation of this self-aligning idler is sensitive and instantaneous. If for any reason, the conveyor belt runs to one side it has a tendency to swivel the idler in a horizontal plane. If this in itself is not sufficient to cause the idler to swing enough to force the belt to throw back immediately, the belt will continue traveling to one side until it contacts the counterweighted end disc, which is slightly larger in diameter than the idler roll. Contact with the counterweight tends to rotate it, but since it is a counterweight it resists this tendency to rotate and produces a counterforce on the idler. This causes the idler to swivel rapidly, throwing the idler more out of line which then immediately forces the belt to swing back the other way.

Fire Extinguisher Cabinet

Manufacturer: Erie Supply and Equipment Company, Sandusky, Ohio.

Claims: This protective cabinet is designed to safeguard fire extinguishers from criminal tampering. Although padlocked, in case of emergency the cabinet may be opened quickly without the use of a key. Glass windows in the sides of the box provide ready inspection of the extinguisher at all times. The cabinet also protects the extinguisher from weather and atmosphere conditions, keeps it free from grease, dirt and grime, and reduces corrosion. It is available in metal or non-critical materials.

Welder Trailer

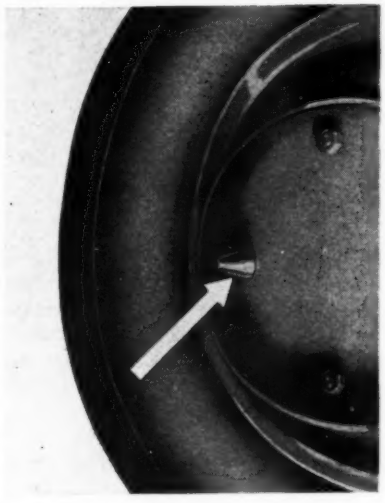
Manufacturer: Harnischfeger Corporation, Milwaukee, Wisconsin.

Claims: To aid in conserving rubber for direct war needs, this all-steel wheel portable mounting for P & H gas driven welders, is substituted for the rubber tired trailer. The new trailer is of the two-wheel type, equipped with an axle and heavy duty springs and is suitable for field work and highway towing. The wheels are designed to permit quick change-over to a wheel with pneumatic tires when available later.

Tire Lock

Manufacturer: Streeter - Amet Company, Chicago, Illinois.

Claims: This tire lock is a simple, inexpensive protection against tire theft. It is an ingenious lock that has no key, no tumbler, no pins and no fragile parts. The lock is so small that it



does not disturb wheel balance. It is made of tough hardened steel and is of a shape that won't permit any known tool to be used for removal. One lug nut or bolt is replaced with the lock. Only the person with the cap part of the lock can remove it. For maximum protection it is designed in many different combinations.

2-CYCLE DIESEL

It's Husky! It's Sturdy! It's Tough!

It's the most outstanding Diesel in the construction industry, this hard-hitting, double-powered, 2-cycle engine. It "packs a real wallop" that carries it through the toughest going—it gets in there and lugs where ordinary engines stall—and it keeps on purring along without constant nursing and attention, a full sixty minute hour . . . 24 hours per day . . . if necessary.

Service records indicate thousands of hours of operation without overhauls or major repairs on tough, three shift jobs. That's the kind of service Allis-Chalmers tractor owners are getting from their 2-Cycle Diesels. It's the kind of performance that gets jobs finished on time and at less cost — the kind of performance you've always wanted in a tractor engine — the kind of performance only a 2-Cycle Diesel can give you.

If you are not already a 2-Cycle Diesel owner, it will pay you to check up on this modern power. Be prepared for the future. Write for complete information.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE · U. S. A.

2-Cycle
THE MODERN
DIESEL POWER

JOB SHORT-CUT WINNER

$5 to Fred Gott, 841 E. 67th St., Seattle, Washington, for the Following Short-cut Method:

"One winter we had a pile of muck to get off the grade. It was too deep to get a tractor through it. All we could do was push it up a little and that made it worse. So we took two A-C's, one HD-10 and an LO, both with angle dozers. We angled the blades and worked the machines side by side. The blades were angled so they formed a point (illustration). The two angle dozers went through the muck pile and worked it down to solid footing so the other dozers could get rid of it. It worked good."

• • •

You, too, can win $5 and at the same time help the war effort! Send in your Job Short-Cut suggestions and ideas on How To Make Tractors and Graders Last Longer. Allis-Chalmers will pay $5 for each suggestion accepted for publication in future advertisements.

For your convenience in writing to Allis-Chalmers, you will find a card bound in this issue.

Shots from the FIRING LINE

All Trucks Must Be Registered by Nov. 15

In general order ODT 21, issued September 8, the Office of Defense Transportation announced that effective November 15, 1942, it will take over control of the use of virtually all trucks, buses, taxicabs and similar commercial vehicles in an effort to attain maximum conservation of such equipment for war purposes and essential civilian uses.

Every vehicle affected by the order will be required to carry at all times a "certificate of war necessity" (equivalent to a federal license) governing the maximum mileage that may be operated or minimum loads that may be carried, or both. Operators subject to the order will not be able to obtain gasoline, tires or parts without a certificate.

Exempted from the order are:

1. Private passenger cars.
2. Commercial vehicles operated by or under the direction of military or naval forces or state militia.
3. Commercial vehicles operated by dealers exclusively for the purpose of selling such vehicles.
4. Motor vehicles having a capacity of not more than seven persons used in group riding to and from work, if such vehicles are not used in any other service for compensation.

The new regulations for commercial vehicles are similar to recommendations recently reported to have been made to to president by ODT for controlling passenger car use to conserve tires. Some Washington authorities regard the truck and bus plan as a forerunner of what may be in store for passenger car owners as an alternative for nation-wide gasoline rationing. It is pointed out that the commercial vehicle plan in its practical application is a form of gasoline rationing.

State and local officers are authorized to report violations of the order and ODT retains the right to change or cancel any certificate in whole or in part. The order authorizes ODT to direct operations of motor vehicles regardless of contracts, leases or other commitments and owners may be directed to rent or lease vehicles under certain conditions.

Applications for certificates of war necessity must be made on ODT forms and submitted to the field office nearest the respective home office or principal place of business of the applicant unless otherwise directed.

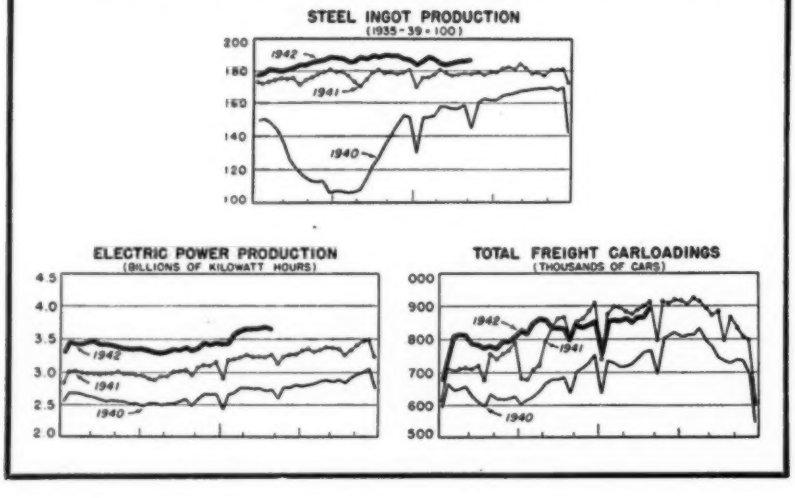
The non-transferable certificates will specify the name and address of the person to whom issued; vehicle or vehicles covered; purposes for which and the conditions under which the vehicle or vehicles may be operated, and other terms or conditions as ODT may direct.

Official inspection of tires will be required every 5,000 miles or at the end of each 60-day period, whichever occurs first, and the order prohibits use of any vehicle until official recommended adjustments and repairs are made.

Operators affected by the order will be required to keep weekly records of operations on the back of each certificate and must keep such other records and make reports as required on ODT.

• Work proceeds on the Alaskan highway as emergency pontoon bridges of this type allow men, equipment, and supplies to move to advance points on the project. (Wide World Photos)

BUSINESS INDICATORS

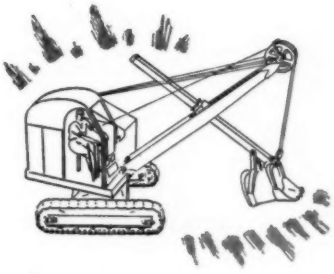


WPB Orders Nationwide Equipment Inventory

Under the terms of an order issued by the War Production Board (Limitation Order L-196) all persons owning used construction equipment registered the same with the WPB on or before September 30, 1942. While other branches of the WPB have previously requested similar information from owners of equipment the new order constituted the first effort of the WPB to

KEEP YOUR SHOVEL *DIGGING* FOR UNCLE SAM

Good maintenance is especially important today when new equipment is hard to get and existing equipment is called on for high-speed 3-shift service. Here are a few simple rules that may help keep your shovel digging more for longer:



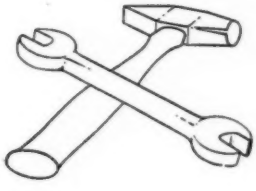
1. Lubricate regularly, following manufacturer's instructions carefully.

2. Keep machine clean.

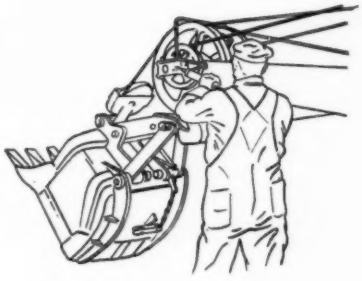
3. Keep fuel, lubricants and radiator water clean.

4. Inspect machine at least every 6 shifts and tighten any loose bolts.

5. Fix troubles while they're still little ones. Don't let them grow.



6. Try to lay out work and drainage so machine works on dry footing.



7. Do not "sweep" the pit by sideways dipper motion.

8. Do not start swing until dipper has been hoisted or retracted clear of bank.

Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

Enlarged reprints of this ad are available for your bulletin boards. In the reprints, the Bucyrus-Erie signature is omitted to leave room for your own name. Write for your copies.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

HORACE LYLE HUDSON

Horace Lyle Hudson, 49, manager of The American Agricultural Chemical Company, Pierce, Florida, died on August 5, after a long illness. A prominent figure in Florida's agricultural chemical products industry, Mr. Hudson's death comes as a shock to his many friends despite his long illness.

A graduate of Salt Lake City High School in June, 1912, Mr. Hudson earned a B.S. degree in electrical engineering from the school of mines of the University of Utah in June, 1916.

Upon graduation in 1916, he accepted a job in the test department of Westinghouse, but did not report for duty as the National Guard field artillery unit to which he belonged was called into service for duty on the Mexican border. While there, from June, 1916, to January, 1917, he took examinations for and was commissioned 2nd Lieut. in the regular army on March 22, 1917. Later he was promoted to 1st Lieut., then Captain and served on the Mexican Border with the Sixth Cavalry until March, 1918, when his regiment went overseas with the A.E.F.

He was transferred to Brest in April, 1919, as Assistant Base Adjutant, and later promoted to Base Adjutant. His duties consisted of handling administrative work necessary in returning over one million troops through that port to the United States from April, 1919, to January 6, 1920. After cessation of troop movements, he was transferred to Germany and given command of the 12th Provisional Guard Company. This company was engaged in guarding large quantities of amunition, material and surplus war supplies scattered over the American Area along the Rhine from Coblenz to Andernack.

In October, 1920, Mr. Hudson was transferred to the United States, and assigned as Quartermaster of Edgewood Arsenal, Maryland. This arsenal is the chemical manufacturing and reserve depot for the Chemical Warfare Service.

Retiring from army life in December, 1922, Mr. Hudson came to Florida and invested in a truck farm and later was employed by the Daytona Public Service Company. He resigned from this position in 1924, after this property was sold to a large utility chain.

Mr. Hudson started his association with The American Agricultural Chemical Company as an analytical chemist on November 19, 1924. Later he was transferred to the engineering department, and was made superintendent.

On May 1st, 1940, he was appointed manager of The American Agricultural Chemical Company, upon the retirement of Burdett Loomis, Jr., who had served as manager for 30 years.

He is survived by his wife. Interment was at Oak Park Cemetery, Lakeland, Florida.

conduct a nationwide equipment inventory on a mandatory basis. Issued on August 31, 1942, the new order directed that every person owning construction equipment, with the exception of the Army, Navy, Maritime Commission or persons acquiring equipment for export, register the same within thirty (30) days by submitting WPB Form 1159.

In addition to this nationwide registration of construction equipment, the order required that the owner notify the WPB within one week after any used construction equipment — (1) is moved from the project on which it is being used; (2) becomes idle after completing its work on that project even if not moved; (3) is put into use on a project; or (4) has had its ownership changed. Any such change in status of equipment must be reported on WPB Form 1333.

To administer the provisions of L-196 there was established in each regional office of the War Production Board a construction machinery regional specialist. Generally, it will be the function of the specialists in the various WPB regional offices to act as a focal point in their respective regions for all information as to the availability of used construction machinery for diversion to the war effort, either on a rental or outright resale basis. Present procedures indicate a highly decentralized plan of operation through the regional specialist who will be in direct charge and handle all related problems within their respective regions.

The immediate program contemplates: (1) Obtaining and maintaining a record of all available used construction equipment throughout the United States; (2) Determining the repairs, if any, necessary to put such equipment in usable condition and assist in arranging for such repairs; (3) Determining, in conjunction with representatives of the Army, Navy, other governmental agencies, and contractors engaged in governmental construction, the need for construction equipment; and (4) Acting as expediter in the sale or rental of used construction equipment and making recommendations for the assignment of available used construction equipment to those jobs which are most important to the war effort.

War Construction Continues In Record Volume

New construction projects continued in very large volume through August, according to F. W. Dodge Corporation. Total building and engineering contracts awarded during this month in the 37 eastern states amounted to $721,028,000. This was the fourth largest monthly total on record, having been exceeded only in August of last year and June and July of this year. The decrease from August 1941 was 5 per cent; from July 1942, 24 per cent.

As compared with August of last year, non-residential building contracts last August increased 42 per cent in dollar volume; residential building declined 57 per cent; public works and utilities (heavy engineering projects) declined 12 per cent. As compared with July of this year, privately financed residential building contracts showed in August an increase of nearly 12 per cent, whereas publicly financed residential building decreased 38 per cent.

Inventory Your Man Power Now

By Major General Lewis B. Hershey, U.S.A.
Director of Selective Service

Manpower is a most important strategic material of today. Every employer should make a prompt inventory, appraisal and analysis of the manpower in his own plant as he would inventory his stock pile. In order to keep production going and at the same time furnish men for the armed forces, industry should now establish an orderly replacement program.

In order to secure temporary deferments for essential men while he is training women, young men, older men, men physically handicapped or those with a high degree of dependency, the employer should know the fundamental principles in the operation of his local selective service board. Certain steps should now be taken by each employer. He should know how many men on his pay roll are between the ages of 20 and 45. He should investigate the classification of every one of those men. On the basis of such an inventory he should prepare to plan ahead and train men for replacement of those who must necessarily enter the armed forces if we are to have the sort of army which can win the war.

Deferments, granted so that employers may train women or men not liable to early induction, are temporary deferments; they cannot exceed six months and in many cases may be for only thirty, sixty or ninety days.

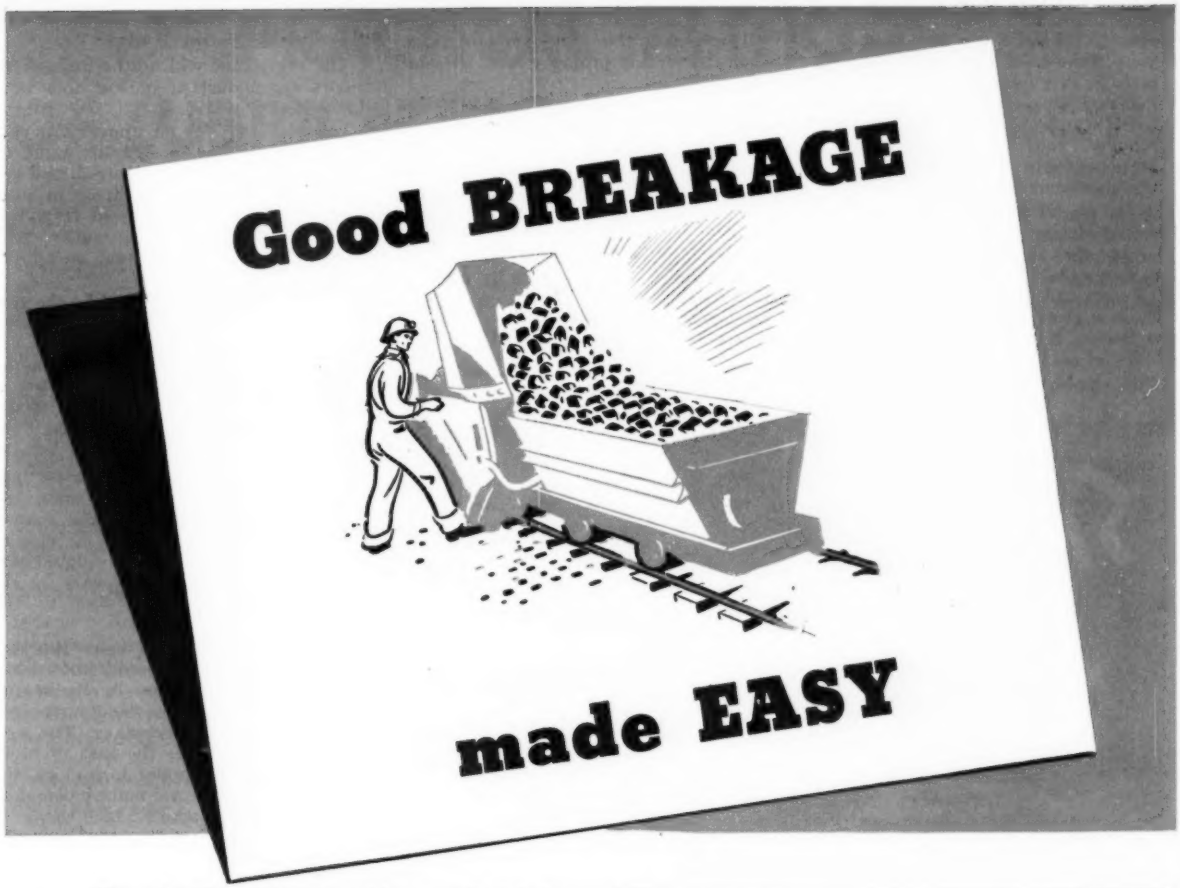
The fundamental purpose of every deferment of a registrant is to allow an employer to train a replacement. Only in a few rare instances can an employer expect to have these temporary deferments continued for more than the six months period. These are only in cases where an abnormally long period of training is required for a replacement.

Employers may seek the deferment of their necessary men with or without their consent.

Here is how they go about it.

On page 3 of the Selective Service Questionnaire (Form 40) which is sent to each registrant before he is classified is the following:

Instructions.—If your employer believes that you are a necessary man



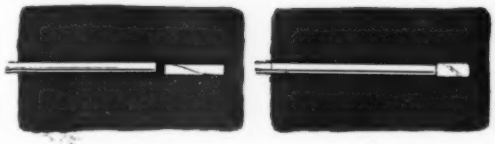
Hercules Tamptite Cartridges pack tightly without slitting. This ingenious new wrapping allows the explosive to expand inside the shell under pressure of the tamping stick.

The charge is concentrated to fill the bore-hole with minimum air space around the explosive, and no spilled powder even when loading uppers.

Result: time and labor saved, more ore or faster tunneling, better breakage for faster mucking made easy.

Ask for Tamptite Cartridges the next time you order Hercules Explosives.

Here's how TAMPTITE makes efficient Loading easy

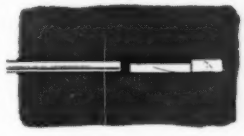


1

The regular-size cartridge goes in the bore hole. Note the space to be filled.

2

Pressure from the tamping rod compresses the powder to fill the space.



3

Another cartridge goes in—Compaction takes place inside the wrapper.

4

The charge is concentrated for better blasting results.

HERCULES POWDER COMPANY
INCORPORATED

927 KING STREET · WILMINGTON · DELAWARE

A-10

For your convenience in writing to Hercules Powder Company, you will find a card bound in this issue.

in a necessary occupation, it is his duty to fill out Form 42A requesting your deferment. You may also attach to this page any further statement by yourself which you think the local boad should consider in determining your classification. Such statement will then become a part of the questionnaire.

This is on all the questionnaires distributed during the past six months. The fact that the Selective Service System now specifically mentions the filing of Form 42A as the manufacturers' duty is a clear indication of the Selective Service System view on the responsibility of each employer in this matter.

The employer can secure Form 42A at the local board and the local board will consider the employer's request when the form is properly filled out and signed.

If such request should be denied because the man, after consideration of the claims offered for him, is not considered to be indispensable to the company's operation, and is needed more in the armed services, the local board will advise the employer of its refusal of such an occupational deferment.

The local board does this by sending to the employer, at the same time it notifies the registrant of his classification, a Form 59.

There are ten days after Form 59 is mailed by the local board to the employer during which the employer can appeal the registrant's case.

The registrant will not be ordered to report for induction during this ten-day period.

In order to take an appeal the employer simply has to sign his name to Form 59 which he has received, and return it to the local board; or in case the Form 59 is not received from the local board, any written request will have full value to make such an appeal effective.

When Form 59 is returned by the employer the appeal procedure becomes automatic.

All necessary forms are available at the local board in the employer's immediate vicinity or at the office of the state director of selective service.

If the local board and the appeal board deny the appeal for the occupational deferment of a key man, the employer may then bring the matter to the attention of the state director at the state selective service headquarters, with the request that the case be reopened or appealed by him to the president.

A double duty rests upon the employer. He should personally know what his manpower situation is. He should not leave the job to a minor employee to decide who is necessary. The employer who delegates the task of filing a request for deferment to a clerk, the executive who does not make a complete inventory of his whole plant today, is negligent. Likewise, the employer who files requests for deferment of men who can be replaced by women, or others, is keeping reinforcements out of an army which is battling for us all. The employer engaged in essential war production who has been required to greatly expand his plant and who then fails to request deferment for his key men is also negligent.

A good rule to follow: Don't ask deferments for any men who can be replaced by training another individual not likely to be eligible soon for service in the armed forces.

Make an inventory, request deferment for any man whose immediate going into the armed services would retard production of vital war material or other services essential to the war effort, or who is needed to maintain national health, safety and interest.

Only when an employee is working in a critical occupation within an essential industry should a Form 42A be filed for his temporary ocupational deferment.

U. S. Engineers Establish Equipment Pool

The U. S. Army Corps of Engineers is establishing a huge pool of heavy construction equipment for rental to contractors building army projects. All types of heavy construction equipment. including tractors and allied tractor equipment, power shovels, cranes and draglines, trenchers and similar equipment, trucks, crushing, screening and

EXTRA OUTPUT from Rock Drills is dependent on both drilling speed of the machines and their ease of operation. Thor Drills, with the patented Short Travel Tubular Valve, drill faster on any kind of going. They are faster in action, too, because the Thor four position throttle gives the operator complete control of drilling speed for all operations from hole starting to full power.

CAN'T AFFORD DELAYS

Besides faster performance, you need dependable performance. Thor Rock Drills give you this, too, because they are built of drop forged steel for "round the clock" service. Be sure your Rock Drills give you not only high output but also protection against breakdowns and job delays. Your Thor distributor can give you expert advice on selecting the Rock Drill that can give best performance and longest service for your particular type of work. Feel free to call on him at anytime.

• Rock Drills • Paving Breakers • Clay Diggers • Saws • Hammers • Sump Pumps • Concrete Surfacing Grinders

Thor Portable Power Tools

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO, ILL.

"THERE IS A THOR SERVICE BRANCH NEAR YOU"

1411 3rd Ave., N. Birmingham, Ala.
78 Brookline Ave. Boston, Mass.
521 Genesee Bldg. Buffalo, N. Y.
1740 E. 12th St. Cleveland, Ohio
15605 Woodrow Wilson Detroit, Mich.
6200 E. Slauson Ave. Los Angeles, Calif.
2637 W. Clybourn St. Milwaukee, Wis.
330 W. 42nd St. New York, N. Y.
1701 Fairmount Ave. Philadelphia, Pa.
803 Wabash Bldg. Pittsburgh, Pa.
4044 Forest Pk. Blvd. St. Louis, Mo.
216 S.W. Temple St. Salt Lake City, Utah
315 S. Van Ness San Francisco, Calif.
1741 First Ave., S. Seattle, Washington

INDEPENDENT PNEUMATIC TOOL CO.
600 W. Jackson Blvd., Chicago, Ill.

For your convenience in writing to Independent Pneumatic Tool Co., you will find a card bound in this issue.

PRACTICAL METHODS OF LUBRICATING YOUR WIRE ROPE

. . . to help you get longer service . . . to help you conserve steel

The benefit derived from systematic lubrication of wire rope is one of those apparently intangible things that are difficult for the average user to find among his many operating problems. However, laboratory and scientifically controlled field tests have proved that wire rope, like any machine part, lasts longer if it is kept well lubricated.

What are some simple ways to lubricate wire rope on your job?

Preparation

It is very desirable that the rope be clean and dry. A jet of air, steam, or wire brushing, followed by a period in which the rope is allowed to dry, are some of the methods used preparatory to applying the lubricant.

First, you can brush the lubricant on to the rope

FIG. 1

Illustrated, in Figure 1, is one easy and effective method of applying lubrication. Dip the brush into the lubricant and apply. In some cases a rag or piece of sheepskin is dipped in the lubricant and used to swab the lubricant on to the rope.

Applying by hand with leather gloves

FIG. 2

Another simple method is shown in Figure 2. Leather is preferred to canvas, because of its greater protection and less penetration of the grease.

This method is especially good where a heavy, non-flowing lubricant is applied. It is often desirable to heat lubricant slightly to get a smoother, better application.

You can make a simple lubricating device

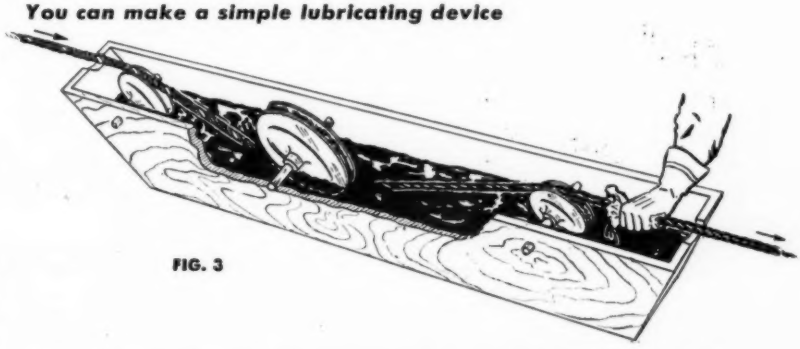


FIG. 3

A wooden trough with a sheave mounted on a shaft does a good job.

Such a trough, or slush box, is illustrated in Figure 3. The rope is run over the end of the trough, under the sheave, and out the other end so that the rope runs through the lubricant. A rag or swab held in place at the outgoing end wipes off excess lubricant. A slush box for vertical ropes is shown in figure 4.

Proper lubrication helps to seal in the Macwhyte internal lubrication that covers each wire during the manufacture of the rope. It helps to keep out water and dirt, and guards against corrosion.

Regular inspection of the rope with frequent applications of lubricant produces better results than heavy coatings less frequently applied.

The methods illustrated are those in most common use and cover most wire rope applications. Various methods used in service often depend upon the particular type of lubricant and whether it is applied hot or cold.

The use of wire rope varies so greatly that it is not possible to set forth here any particular types of lubricant to use. Macwhyte engineers are always glad to give you the benefit of their experience in special cases.

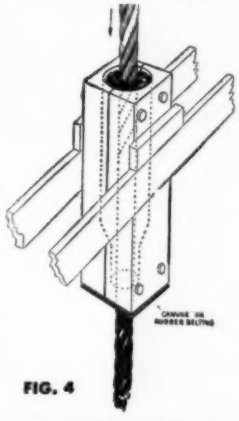


FIG. 4

This is number 12 in a series of informative articles prepared by the Macwhyte Wire Rope Company. All articles in this series are available on request.

MACWHYTE COMPANY
2940 Fourteenth Avenue • Kenosha, Wisconsin
Mill Depots:
New York • Pittsburgh • Chicago
Ft. Worth • Portland • Seattle • San Francisco
Distributors throughout the U. S. A.

Macwhyte Company Manufactures:
MACWHYTE PREformed and Internally Lubricated Wire Rope
MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Cable
MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie Rods

NO. 641
MONARCH
Whyte Strand
PRE-FORMED
WIRE ROPE
Macwhyte's premier wire rope, famous for its strength, toughness, and internal lubrication.

For your convenience in writing to Macwhyte Company, you will find a card bound in this issue.

batching equipment, compressors, graders, rollers and pavement finishers, are included. It is designed to conserve the nation's resources of construction machinery and to expedite completion of army construction projects. It is administered by the Construction Equipment Branch, Operations Division, Corps of Engineers.

Phosphate Rock Production

According to reports of producers to the Bureau of Mines, United States Department of the Interior, mine production of phosphate rock in the first half of 1942 was slightly less than in the similar period of 1941. However, that sold or used in the first half of 1942 was 2,227,313 long tons, or 129,519 tons greater than in the corresponding period of 1941, and the value, $7,672,938, was nearly a million dollars greater. The average value of phosphate rock sold or used increased from $3.21 in the first half of 1941 to $3.44 in the corresponding period of 1942. Total stocks in producers' hands declined slightly, but Florida was the only state showing a decrease. Domestic consumption, which cannot be shown because of a lack of export and import data, is known to have been greater than during the first half of 1941.

Because of wartime restrictions no data on phosphate rock imports and exports for the first six months of 1942 are available.

In the first half of 1942, phosphate rock was mined in Florida, Tennessee, Idaho, and Montana, and apatite in Virginia. Florida, as usual, was the leading shipper, although shipments of hard rock, land pebble, and soft rock all decreased. The average values of all types increased, resulting in total values of land pebble and soft phosphate sold or used somewhat greater than in the first six months of 1941. However, the decline in the quantity of hard rock sold or used was so great—from 10,092 tons in January to June 1941, to 3,200 tons in the similar period of 1942—that the total value was very much less in the latter period although the average value was much higher. The quantity of Tennessee rock, including a small tonnage of apatite from Virginia sold or used in the first half of 1942 was very much greater than in the corresponding period of 1941. Increases were likewise recorded in both average and total values. In Montana and Idaho both the quantity and average value of phosphate rock sold or used in the first six months of 1942 were higher than in the January to June period of 1941.

Electronic Tubes Control Utah Tunnel Traffic

Expansion of the great Utah Copper Company open cut mine made it desirable for Salt Lake County, Utah, to abandon the county highway which ran across the ore body.

It was decided to construct at Bingham a vehicular tunnel, approximately 6000 feet long through a mountain to allow abandoning the highway across the ore deposit.

The company was faced with the problem of making this tunnel wide enough for a two-lane highway, which would be a very expensive project, unless equipment could be obtained to automatically control the traffic through a single-lane tunnel. Contractors' estimates indicated an appreciable sum could be saved by constructing a single-lane instead of a two-lane tunnel.

Salt Lake County officials decided to approve the single-lane tunnel if General Electric Company would agree to furnish automatic traffic control for it.

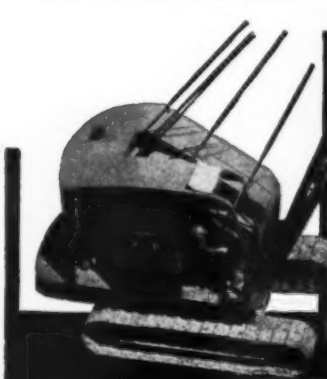
General Electric agreed to tackle the job and the single-lane tunnel construction was started.

The automatic traffic control had to meet the following cycle:

1. Prohibit all vehicles from entering the tunnel until it is clear of traffic.
2. Allow traffic to enter only at one end for three minutes.
3. Prohibit all vehicles from entering either end of tunnel until it is clear of vehicles.
4. Allow traffic to enter only at the other end for three minutes.
5. Prohibit all vehicles from entering

WELDED
ROLLED STEEL CONSTRUCTION
FOR GREATER STRENGTH AND SPEED

An operator really makes time with a Williams Bucket on the end of his boom. A few grabs and another full loaded truck is on its way. Williams Buckets have tremendous closing power—they dig deep—bite clean and come up with heaping loads. Williams Buckets are "built to last and move dirt fast". And that's exactly what a contractor wants—long service at little maintenance cost, and fast, dependable action when moving yardage spells profits.



If you want the full engineering story on each type and capacity of Williams Buckets, send for individual descriptive folder. You'll find ample reasons why your next bucket should be a Williams.

THE WELLMAN ENGINEERING CO.
7002 CENTRAL AVE. • CLEVELAND, OHIO
Distributors in all parts of the country

WILLIAMS *Buckets*
built by WELLMAN

For your convenience in writing to The Wellman Engineering Co., you will find a card bound in this issue.

You Win All the "Chips" with the Universal 27-G Porto-Plant!

The Efficient Screen Unit!

Double Deck Auxiliary Vibrating Screen shakes out chips which are conveyed to truck or stock pile—balance of crushed material is conveyed to main screen over mixing hopper.

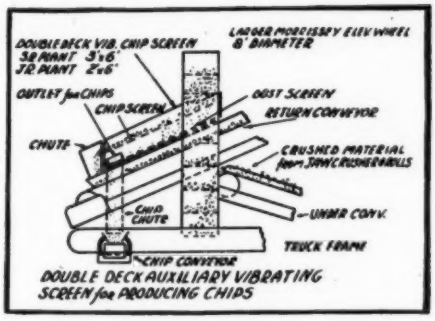
Where there's a big demand for chips for seal coating airports and roads—and there's a lot of it being done these days—the 27-G gives you the winning cards.

A Western state road commission* reported:

"We purchased a Universal 27-G Portable Gravel Plant in May, 1941 and our experience with it has been very favorable compared to similar size plants of other makes operating in this territory. The production capacity of the Universal seems much higher. *On a 5-day test run, July 1st to 5th, production of chips alone averaged 210 yards per 8 hours.* This is exceptional capacity and we can highly recommend this plant for highway work."

This bonafide letter from our files was passed on to us by a prospective purchaser who inquired of this user what they thought of their 27-G. Every contractor, pit owner and highway commission using them has similar praise for them! Send for Specification Sheet 27-G detailing the 4 sizes.

*Name on request.



DOUBLE DECK AUXILIARY VIBRATING SCREEN for PRODUCING CHIPS

A low cost chip screen on the return conveyor of this compact dual crushing plant provides a high chip yield — makes a separate screening operation unnecessary.

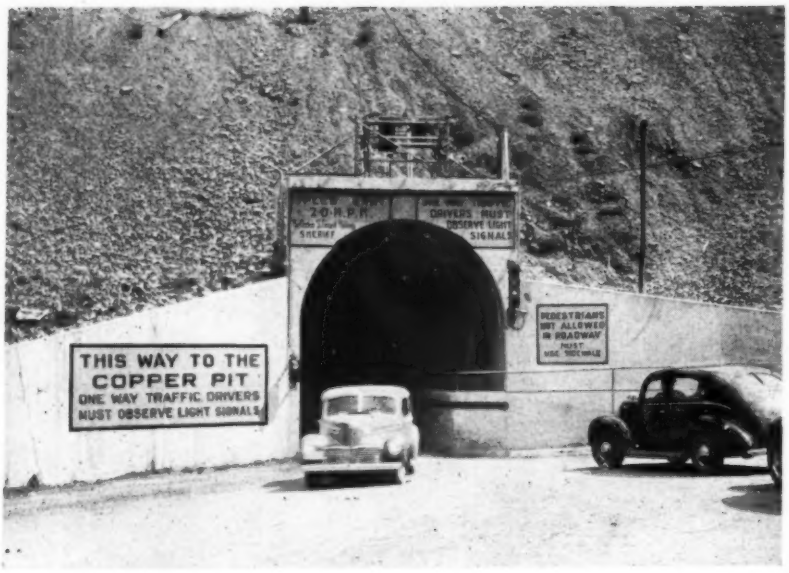
UNIVERSAL CRUSHER COMPANY

610 C Ave. West — Cedar Rapids, Iowa

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

For your convenience in writing to Universal Crusher Company, you will find a card bound in this issue.



• Lower portal of Utah Copper Company's single-lane tunnel which controls all traffic with "electric eyes."

either end of tunnel until it is clear of traffic.

6. Begin with (1) and repeat.

If the tunnel is not cleared of traffic within 5 minutes after the last vehicle was allowed to enter, an alarm is sounded and all traffic is prohibited from entering the tunnel until the tunnel is clear.

If the carbon monoxide content of the air in the tunnel rises above a predetermined value all traffic is prohibited from entering the tunnel and the ventilating fan starts and continues to run until the carbon monoxide content falls to a predetermined minimum at which time the fan stops and traffic is again allowed to flow.

All this is fully automatic and is basically done by electronic tubes.

The watchmen of the tunnel are electronic relays ("electric eyes") which count the vehicles as they go into the tunnel and again as they go out of the tunnel. When the same number of vehicles have left the tunnel as have gone into it during any one cycle it is known that the tunnel is clear. If the outgoing count is one less than the ingoing count it is evident that a lost sheep remains in the tunnel. Practice has shown it may be a boy and his girl friend, or more often a car out of gasoline or having motor trouble.

A patrolman stays within hearing of the alarm bell and when it rings he rides through the tunnel to scare out the laggard. He then resets the equipment to allow it to again take up its duty as an electronic watchman.

The elevation of the upper end of the tunnel is approximately 350 feet more than the lower end, resulting in about a six per cent grade.

During most of the year the "chimney effect" is such that the tunnel ventilates itself, so the ventilating fan runs only in case of unusually dense traffic.

Approximately 600 cars go through the tunnel every twenty-four hours with each one causing two operations of the equipment.

States Enforce Speed Control

In response to President Roosevelt's request for the general adoption of a 40-mile speed limit for motor vehicles, four states changed their laws by legislative act, eight effected a change of law by gubernatorial proclamation or other means, and all except six others took some action, according to the Public Roads Administration of Federal Works Agency's report to Brig. Gen. Philip B. Fleming, federal works administrator, following a summary of reports from its district engineers.

Arizona, Maine, New York and Virginia changed their speed laws from "no fixed limit," 45, 40 "prime facie," and 50, respectively, to maximum limits of 40, according to the reports.

The 40-mile limit was put into effect by proclamations of the governors in Minnesota and Wisconsin; by a published notice by the governor and commissioner of motor vehicles in New Hampshire, by action of the commissioners of motor vehicles and highways in New Jersey, and of the state highway commission in New Mexico. It was made effective by resolutions of the state highway commissioner in Arkansas and the state traffic commission in Connecticut, and by police instructions in South Dakota. Four of these states previously had no fixed limit, two had limits of 60 miles, one a limit of 50 miles and another a limit of 45 miles.

WPB Road Construction Equipment Figures

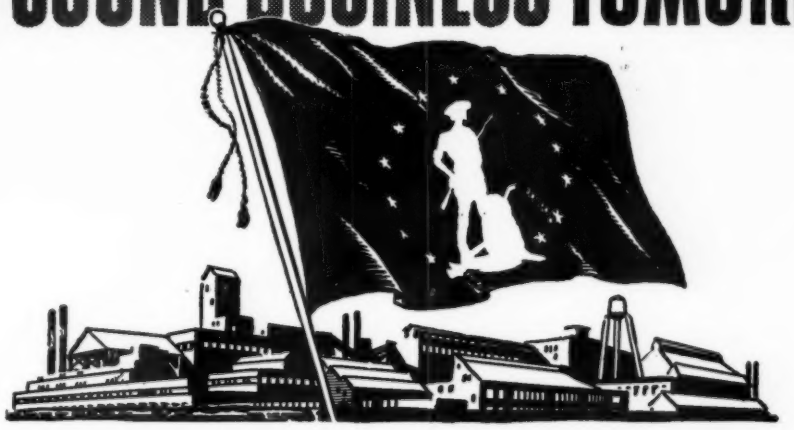
Figures showing the availability of mobile road construction equipment in the United States have been released by the Bureau of Governmental Requirements of the War Production Board.

The figures, showing the road construction equipment owned by states, cities, counties, and towns are as follows:

Tractors, 16,693; motor graders, 16-773; pull type graders, 16,005; carrying scrapers, 4,958; maintainers, 3,250; angle and bulldozers, 1,382; snow plows, 25,347; and varying amounts of 27 other classes of equipment used in the construction and maintenance of roads.

For your convenience in writing to The Owen Bucket Co., you will find a card bound in this issue.

FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW



Get This Flag Flying Now!

This War Savings Flag which flies today over companies, large and small, all across the land means *business.* It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are doing their part for Victory . . . by helping to buy the guns, tanks, and planes that America and her allies *must* have to win.

It means that billions of dollars are being diverted from "bidding" for the constantly shrinking stock of goods available, thus putting a brake on inflation. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity *tomorrow,* keep the War Bond Pay-roll Savings Plan rolling in *your* firm. Get that flag flying now! Your State War Savings Staff Administrator will gladly explain how you may do so.

If your firm has not already installed the Payroll Savings Plan, *now is the time to do so.* For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

EVERYBODY EVERY PAYDAY AT LEAST 10%

Save With

War Savings Bonds

This Space Is a Contribution to America's All-Out War Program by

EXCAVATING ENGINEER

State and local highway officials who desire to obtain the use of such equipment should write to the Bureau of Governmental Requirements, which seeks to put local governments in touch with other governmental units whose equipment may be lent or rented.

A careful check is made by the bureau on all machinery in use and all machinery which is idle. The availability of such information facilitates the construction of roads required by war plants, army camps, and war housing projects without the use of critical materials for the manufacture of new highway equipment.

A survey made by the bureau indicates that there is sufficient road construction equipment in the country for all subdivisions of governments for at least the next two years, provided that it is carefully maintained.

Dig, Haul, Dump

in one operation!

On jobs where materials are to be moved distances of several hundred feet or more, a SAUERMAN Drag Scraper or Cableway is a great money-saver because it will dig, haul and place the materials without the help of other equipment.

First cost of a SAUERMAN machine is reasonable, maintenance expense is small, and the simplicity of operation permits easy one-man control of even the largest installation.

This equipment is very flexible and is readily adapted to meet new and difficult working conditions. Sizes range from small portable units designed for cheap handling of a small hourly tonnage of loose materials up to powerful machines that will move as much as 1,000 tons per hour of the toughest materials.

Write for our catalog and see for yourself how others have cut costs on hundreds of dig-and-haul jobs with SAUERMAN Machines.

SAUERMAN BROS., Inc.
574 S. Clinton St., Chicago

Rosoff Contracts for Mexican Irrigation Job

By F. N. Hollingsworth

Construction of a $4,654,632 irrigation project, including a large dam and a distribution tunnel will be undertaken by Samuel R. Rosoff, Ltd., of New York City, on behalf of the Mexican government. The project is located in the Valequillo District of the state of Puebla. The tunnel will be about eight miles long and almost seventeen feet in diameter.

It must be dug through mountainous terrain and modern construction equipment similar to that used in the United States will be shipped from New York to Mexico. According to the terms of the contract the work must be completed within 3½ years. A staff of engineers has been sent by the Rosoff organization to Mexico to begin preliminary work. This organization is the one which received the $45,705,000 contract for the new Gatun Locks of the Panama Canal. The Puebla project is one of the main items in the Mexican Agricultural Development program.

Safety Congress Convenes

"Save manpower for warpower!" That is the theme of the 31st National Safety Congress and Exposition to be held in Chicago October 27-29, according to a National Safety Council announcement.

The first wartime congress since 1918 will be devoted completely, the council said, to the safety job now at hand—to help win the war.

The entire congress program, covering every phase of safety with 175 sessions and 500 program participants, will be centered on the problem of stopping accidents that delay victory by slowing production, impeding the movement of troops and supplies, and wasting manpower, materiel and time.

The congress is the annual convention of the National Safety Council. It is the largest safety event in the world. Attendance averages 10,000, and safety leaders from all parts of the country assemble to exchange ideas, experiences and problems. Delegates this year will work overtime to cram the program into three days, instead of the usual five, and thus avoid week-end travel.

Sees Danger In States Acquiring Local Roads

Extension of state highway systems to include roads primarily of local importance is an unsound public policy, Dr. Thomas H. Reed, outstanding authority on local government, asserts in a recent study on relationships between the federal, state, and local governments.

"In almost every state there has been a tendency to enlarge steadily the state highway system and reduce the mileage for which local units are responsible," says Dr. Reed, adding that in three states "highways have been wholly centralized" and citing another state that "has taken into her 40,000-mile state system the most traveled one-third of township roads.

"This policy is treating the financial disease of local government by amputation," continues Dr. Reed. "It is undoubtedly effective; sometimes it may be unavoidable; but it means in every instance except as applied to units so small and ineffective as to be moribund, a sacrifice of the principle of local self-government. A re-examination of the functions of government and their reallocation between the nation, the state and the locality, may well be a preliminary to settling their fiscal problems. But no very great reduction can be made in the activities now belonging to local government without seriously impairing the foundations of our democracy."

A similar warning against the unsound policy of overextending state highway systems has been sounded in a report of the Federal Coordinator of Transportation.

HAYWARD BUCKETS

GOOD FOR YEARS OF HARD SERVICE

A HAYWARD Bucket is an investment, not a gamble. It helps you make a profit on every job.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

Save Time!

Use Bucyrus-Erie Tool Wrenches on your blast hole drilling tools — Cast Steel — Heat Treated.

Bucyrus-Erie Co., South Milwaukee, Wis.

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

A BUCYRUS-ERIE SCRAPER

OR 35 - 45 H. P.
RACTORS . . . .

S-45

Capacity
cu. yds. struck
cu. yds. heaped

FOR 70 - 95 H. P.
TRACTORS . . . .

S-112

Capacity
10 cu. yds. struck
12½ cu. yds. heaped

OR 45 - 55 H. P.
RACTORS . . . .

S-67

Capacity
cu. yds. struck
cu. yds. heaped

FOR 95 H. P. AND
LARGER TRACTORS

S-152

Capacity
13½ cu. yds. struck
17 cu. yds. heaped

OR 65 - 75 H. P.
RACTORS . . . .

S-90

Capacity
cu. yds. struck
cu. yds. heaped

The many features which contribute to the ease of operation of Bucyrus-Erie Scrapers will protect your tractor and contribute to its long life and low maintenance on tough high-speed war dirt-moving jobs.

ONAL TRACTRACTOR DISTRIBUTOR

• One of the four 1¾-yard Northwest shovels that handled the majority of excavation for Marinship's new shipyard loads out to a GMC truck.

90-Day Shipyard

(Continued from page 501)

moved from South Hill, and 11,949 from the site for a cafeteria.

Material and equipment used on this job, according to John Stearns, assistant manager of facilities construction, included the following: 18 Caterpillar tractors, seven of them equipped with LeTourneau bulldozers; 9 LeTourneau scrapers, 5 Koehring Dumptors; 3 LeTourneau Tournapulls; 4 1¾-yard Northwest shovels; 4 LeTourneau rooters; 2 wagon drills; 8 ten-yard dump trucks; 21 five-yard dump trucks; 2 grease trucks; 1 water wagon; 1 truck crane; 2 flat beds; 1 motor patrol; and 5 one-half ton pickups.

The top stripping was removed from the sloughs with the LeTourneau scrapers. These scrapers were also used as much as possible until the work began to get into rock.

"The rock was pretty easily broken up," says Mr. Stearns. "In the core of Pine Hill point there was mostly metamorphosed sandstone. The top was a sort of sandy clay. Shovels took it off without much trouble."

Blasting was necessary for only about one-third of the excavation. The material was used to fill in areas offshore from the north end of the yard to the southern end as well as on the west side of the highway. The cover material was a red shale rock brought in from a nearby hill. Later on a permanent surfacing will be added, including a light oil coat and a macadam base.

Gordon Ball was in general charge of the work done by N. M. Ball and Sons. M. L. Simpson was the superintendent and W. P. Spencer the engineer.

In the work done at the housing authority site in Waldo, little blasting has proved necessary. The site is set in a natural amphitheatre and four blasts only were required. Here, again, material for the fill was obtained from the surrounding hills.

Four months after the sub-contractors started work on Pine Hill's shale and rock and clay, what was once tideland became the foundation for a mile long shipyard.

While piles were still being driven the shops and buildings had already begun to rise. Most of the shipbuilding work will be under cover since the elements are no respecter of shipbuilding schedules.

The Men Behind the Job

E. C. Panton, manager of facilities construction for the Marinship job, makes light of the work that has been done. "It's just another construction job," he says. But it is this new point of view, the approach of construction engineers, which is revolutionizing the building of ships.

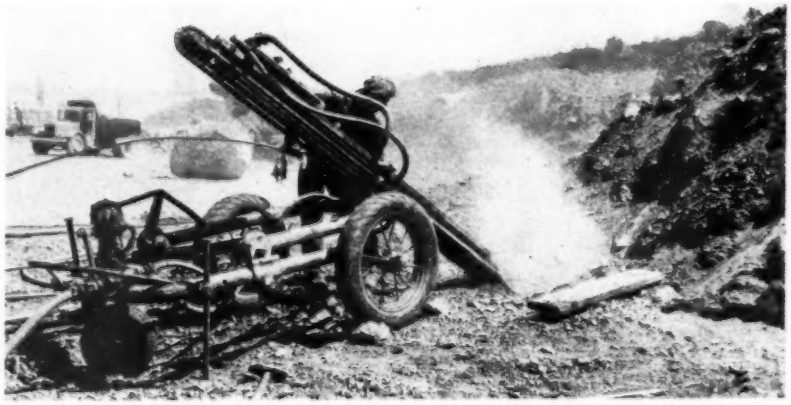
Calship, a Bechtel yard in Wilmington, set a world record in June with 15 deliveries and 11 launchings. S. D. Bechtel, president of the W. A. Bechtel Co., sponsors the work in Southern California, while the company's vice president, K. K. Bechtel, is in charge at Marinship. Their father, W. A. Bechtel, Sr., was president of the original Six Companies combine of western contractors which made its reputation building bridges and dams.

Marinship is expected eventually to employ fifteen thousand shipyard workers. Some 200 were used in the work of preliminary construction, and some 3,000 are at work today building ships.

The shipbuilding began before work was completed on the gantry piers, ways and sub-assembly buildings. Sections are welded together right out on the ground under the balmy California sun. Housing for this work was provided before unsettled weather arrived.

The first building to be completed was the administration building which was put up in 42 days. The largest building in the

• A wagon drill puts down hole in the remains of Pine Hill for the next blast.



layout will be the main warehouse with a floor space of 133,000 square feet. Its foundations were poured in May. By early July, half the building was already in use.

Out in Waldo where the Ball rigs are still at work filling the marsh, construction has already begun on the housing units of the Federal Public Housing Authority. Everywhere it is the same story: speed, speed and more speed at Marinship.

Dwellers in the quiet little town of Sausalito have hardly been able to believe their eyes in the past four months as they have watched the changes taking place.

The story of those changes can hardly be told in words. They have to be seen to be really believed. Every day sees new changes; buildings that appear to spurt out of the ground overnight.

But one fact emerges clearly from the activity; and that is that on San Francisco Bay engineers and contractors allied with each other are putting forth everything they've got in production for victory.

Meet the "Seabees"

(Continued from page 506)

neer Corps, the job of the Navy's "Seabees" is to carry out effectively all phases of construction work in potential combat zones and, after military training, be prepared to effectively resist enemy interference with their assigned task.

From recruiting centers volunteers for this service are sent to naval training stations throughout the country where they remain for thorough training and indoctrination before being assigned to distant bases. At Norfolk, Virginia, a training station is now being erected to accommodate 10,000 men.

Organized along military lines, companies of "Seabees" form regiments of three battalions, each battalion comprising four construction companies of 226 men each and one headquarters company of 165 men, composed mainly of specialists such as clerks, bakers, cooks, pharmacists, etc.

The mission of these construction units is clearly outlined by Rear Admiral Ben Moreell, who, in commenting on this program, stated that "this is a real opportunity for those two-fisted, red-blooded Americans who are not fighting behind a gun to serve shoulder to shoulder with the combatant forces of the U. S. Naval Service."

Consolidated Rock

(Continued from page 505)

than two or three drags are made in one place the bucket will gouge out a groove in the bank. Once that is done, the bucket will constantly run to the "groove" unless a great deal of care and maneuvering is done with the bucket. The general scheme, therefore, is to drag here and there within a radius of the swing circle adequate to fully cover the working face,

GATKE SWING FRICTIONS
Speed Operations
Avoid Delays

GATKE Improved Swing Friction for a Northwest Shovel. Made for all models.

Recent developments in GATKE Moulded Swing Frictions give a man *plenty extra to work with*—

TREMENDOUS POWER—No let down when things get hot.

SMOOTH ACTION—No grabbing or chattering.

LONG WEAR LIFE beyond comparison.

GATKE Clutch Facings. Made for all Road Building, Excavating and Construction Equipment.

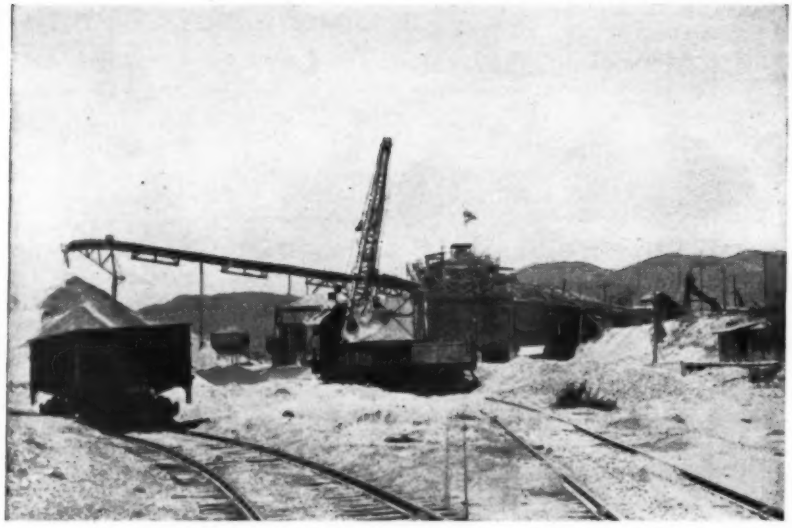
Unless you have Genuine GATKE *Improved* Swing Frictions you are missing plenty! They are *guaranteed* to do the job better and last longer. Use them for your next replacement and *compare results!*

Shipped from stock for popular Shovels, Draglines, etc. Just order by make and model.

If you have problems, *tell us about them.* GATKE has been *licking Tough Jobs for 28 years.*

GATKE CORPORATION
232 N. La Salle St. Chicago, Ill.

For your convenience in writing to Gatke Corporation, Inc., you will find a card bound in this issue.



• Consolidated Rock Company's product is sent on its way from the plant yard. Note Browning crane loading small aggregate to railroad car.

keeping the rock rolling down as evenly as possible.

Loading to Conveyor Belt

The dislodged material rolls down to the toe and separates naturally. Large sized boulders roll to the crawler tracks of the Bucyrus-Erie 120-B, with finer sized material grading evenly up toward the top of the pile. The size of the dipper on the 120-B machine plus a wide arc of upswing travel makes it possible to get a fair cross section of the material into every dipper. This is important, because it keeps the screening plant evenly supplied with the right proportion of sizes.

When a 5-yard batch of raw aggregate drops out of the 120-B's dipper it feeds through the initial gravity type hopper into a Kennedy 30 x 42 inch primary crusher, set for a jaw clearance of 6 inches. This crusher breaks up all oversize boulders as they pass through. They, with the rest of the finer material, then pass over a variable length conveyor run which dumps into a secondary feeding hopper. This hopper equalizes the flow of rock as it leads to the second conveyor run. When the material falls off the end of that second run it becomes a part of the 15,000 ton surge pile mentioned previously.

A 190-foot reinforced concrete tunnel, built prior to the start of the surge pile, is situated beneath the big reserve storage. An automatic feeder in the roof of this tunnel lets material drop out of the center of the pile to a third conveyor run, which takes it up to the last run before it enters the plant. The rock, at the point where it enters the plant, has been transported by the conveyor system over 2,140 lineal feet of distance and hoisted 140 feet from where it was dug.

Entering the plant, the raw supply passes over a bull screen which removes all rock over 4 inches in size. These large rocks are destined to wind up as crushed rock, so let's follow these big boys through the plant first.

They move off the bull screen into a Symons 28 x 32 inch jaw crusher, whose jaws are set at variable clearances depending on the material run. A 7-foot Symons cone crusher breaks the crushed pieces to final size. Since crushed rock is almost all clean it does not require washing, and it is therefore ready to move on to the sizing screens after crushing.

Sixteen-foot Symons screens grade the crushed rock. As many screens as the number of sizes being manufactured are used. Material falling through these screens goes on separate conveyors leading either to storage piles or to storage bins in the plant itself, where it is weighed out, eliminating any secondary handling. Retained material is still too large, so it is shunted back through the last two crushers before it is finally broken down to size.

Fine Aggregate Production

Let's return now to the bull screen at the plant entrance. That sand, fine gravel and small rock falling through the screen is dirty, and it has to be cleaned thoroughly before concrete inspectors will accept it. No. 1 and No. 2 sand and gravel belts pick up this material and dump it into a Stephens-Adamson No. 9 feeder, which places it in turn into a huge 24-foot revolving trommel screen. The sand is separated immediately from the gravel, falling through the initial openings into the sand washers. Turbid water agitates and cleans the sand, after which it is removed from the washer by a sand drag.

The gravel goes through the trommel to a 16-foot Symons vibrating screen, where jets of water under high pressure clean away all rock dust and clay. When this washed gravel leaves this screen it is beautifully clean and accurately graded to size.

Consolidated Rock, insofar as possible, batches its commercial aggregate directly out from the screening plant without stock piling any extensive supply. This system eliminates any secondary handling expense and assures that the gravel will be clean when it is delivered. Sand, however, is usually allowed to stand about 24 hours so that excess water will drain away and the moisture content will be constant.

The company ships a considerable amount of aggregate in railroad cars direct from the mill bins, while stock piled material is loaded out by crane. A ¾-yard P&H machine or a 1¼-yard Browning steamer swinging a clamshell is used for that. A standard gauge railroad spur connects the yard to the main railroad line leading into Los Angeles. The company maintains its own 50 horsepower Plymouth locomotive for switching.

R. C. Griffin is production manager for the company, and is responsible for much of the efficiency that makes Consolidated one of the better known names in the rock business in southern California today. W. J. "Walt" Schienle, who has been with the company for years, is plant superintendent.

"Aside from your surge pile increase and the puzzle of getting a new shovel in wartime," we asked Walt, "what's your next big problem?"

He didn't hesitate; just straightened his big, kindly bulk in his chair and grinned. "Why, after getting those two problems whipped I just haven't got anymore. Unless," he added as an afterthought, "somebody could tell me how to get a new set of tires for the family bus."

Arc Welder Care

(*Continued from page 503*)

spection of motors and generators is necessary to insure best operation. While some welders are installed where conditions are ideal; where dust, dirt, and moisture are not present to an appreciable degree; most machines are located where some sort of dirt accumulates on the windings. This lowers insulation resistance and cuts down creepage distances.

Inspection of motors periodically is a worthwhile procedure. Most motors require a complete overhauling and thorough cleaning about once a year.

If dust conditions are extreme, the motor and generator should be blown out with dry compressed air (about 25 to 30 pounds per square inch in pressure) as often as needed. Where conducting and abrasive dusts are present, even lower pressure may be necessary, and suction is to be preferred, as damage can easily be caused by blowing the dust and metal chips into the insulation. On most motors the windings are fairly accessible, however, and the air can be properly directed to prevent such damage.

About once a year, welders should be overhauled. First, the heavy dirt and grease should be removed with a heavy, stiff brush, wooden or fiber scrapers, and cloths. Rifle-cleaning bristle brushes can be used in air ducts. Dry dust and dirt can be blown off, using dry compressed air at moderate pressure. Care must be taken to direct the air so that the dust will not cause damage and will not be pocketed in the various corners. Grease, oil, and sticky dirt are easily removed by applying cleaning liquids such as carbon tetrachloride.

If the welder can be spared from service long enough, the insulation of the motor should be dried out by heating to from 90 to 100°C. While the motor is still

ARC WELDER TROUBLE SHOOTER CHART

TROUBLE	CAUSES	WHAT TO DO
Machine fails to hold heat	Rough or dirty commutator.	Commutator should be trued or cleaned.
	Brushes may be worn down to limit of adjustment or life.	Replace or readjust brushes.
	Brush springs may have lost adjustment or may be broken.	Replace or readjust brush springs.
	Field circuit may have variable resistance connection or intermittent open circuit.	Check field current with ammeter to discover varying current. This applies to both the main generator and exciter if used.
	Electrode lead or work lead connections may be poor.	Tighten all connections.
	Wrong grade of brushes may have been installed on generators.	Check with manufacturer's recommendations.
	Field rheostat or tap switches may be making poor contact and overheating.	Inspect rheostat and clean and adjust finger tension on switches.
	Brush-shifting or other mechanical current-adjusting mechanism may have loose or worn links.	Check current-adjusting mechanism for back-lash and play.
Motor trips off line	Power circuit may be single-phased.	Check for one blown fuse or dead line.
	Welder may be operating above current capacity.	Check load against welder nameplate. Check duty cycle.
	Welding electrode or work leads may be too long or too small in cross section.	Check terminal voltage while machine is loaded; it should not exceed 30 volts on all machines or 40 volts on large machines when operating at rated current.
	Ambient temperature may be too high.	Make sure that temperature in motor-generator room or housing does not exceed 100 F. and that there is no interference with normal ventilation of the machine.
Machine fails to start	Power circuit may be completely dead.	Look for open disconnect switch, fuses removed from clips, or blown fuses.
	Power circuit may be single-phased.	Look for one blown fuse or one dead line.
	Power line voltage may not be suitable for motor, or may be extremely low; may be accompanied by chattering of the motor starter.	Check voltage with voltmeter, particularly at the moment of attempted starting.
	Machine may be jammed.	See that armature turns over easily by hand, and look for foreign material in air gaps.
	Motor starter may be single-phased.	Check to see that all fingers on starter make contact when closed.
	Overload protecting relays may be tripped.	See that relay contacts are closed and that starter picks up when push button is pressed. Be sure to remove cause of tripping.
Welder starts but fails to generate	May be running the wrong way.	Check direction of rotation with manufacturer's instructions or direction arrow. On 3-phase motors, direction of rotation may be changed by interchanging any two leads.
	Generator or exciter brushes may be loose or missing.	Be sure that all brushes bear on the commutator and have proper spring tension.
	Exciter may not be operating.	Check exciter output voltage with voltmeter or lamp.
	Field circuit of generator or exciter may be open.	Check for open circuits in rheostat, field leads, and field coils. Also check resistors and rectifiers, if any. Some machines give low output when fields are open.
	Generator may be reversed in polarity due to another machine or incorrect operation in parallel with another machine.	*Flash the field with a storage battery or another generator first with one polarity and then with the other to see if it builds up. (Flash exciter field if set has separate exciter.)
	Series field and armature circuit may be open-circuited.	Check circuit with ringer or voltmeter.
Welding arc is loud, spatters excessively	Current setting may be too high.	Check setting and current output with ammeter.
	Polarity may be wrong.	Check polarity.
		Try reversing polarity or try an electrode of the opposite polarity.

* "Flashing" the field of a generator or exciter is a method of establishing the residual magnetism of the field structure with the proper polarity to cause the machine to "build-up," or generate voltage. It consists of passing a relatively heavy current through the field windings momentarily, using an external source of direct current to supply the power.

If a low-voltage source, such as a storage battery, is used, the series field of the generator should be flashed; if a higher voltage source such as another generator or exciter is used, the shunt field should be flashed.

• The "weaker sex" invades another field as Miss Anna Lauer of Germantown, Pennsylvania, repairs the dipper of a power shovel with the aid of a G-E diesel-powered arc welder.

warm, a high-grade insulating varnish should be applied.

The varnish may be sprayed or brushed on. After applying the varnish, the best results are obtained by baking for 6 to 7 hours at about 100°C. If the machine must be put back into service quickly, or if facilities are not available for baking, fairly good results will be obtained by applying one of the varnishes which dry in a few hours at ordinary room temperatures.

Welder Lubrication

Manufacturers' instructions regarding lubrication of bearings should be carefully noted. These instructions should be kept near the welder so that they are readily accessible. Usually grease-packed bearings have sufficient lubricant when shipped from the factory to last about a year under normal conditions of cleanliness and temperature. When sets are operated in unusually dirty atmospheres, run continuously 24 hours per day, or exposed to extremes of temperature, it would be well to shorten the bearing inspection and lubrication interval down to six months, or less if experience warrants. An occasional check of bearing temperature by feeling with the hand may disclose undue heating before damage is actually done. Once a lubricating routine has been established, it should be carried out, and by reliable men who will follow instructions.

It is pretty generally established that outside of gross neglect for long periods of time, the major causes of bearing troubles are overgreasing and dirt. Overgreasing results in excessive heating of the bearing, frequently with churning and breaking down of the grease with consequent loss of its protective qualities.

Dirt occasionally gets into a bearing through the use of grease that is carried around or stored in uncovered containers. Quite as frequently it gets in through carelessness in protecting parts while bearings are disassembled or opened for inspection. The prevention is obvious but often overlooked:

1. Every part of a bearing assembly, including retainer plates, gaskets, and screws, should be placed in a clean box immediately on removal, and if dropped or otherwise soiled, should not be replaced without a thorough cleaning in a suitable solvent.
2. Only clean hands, tools, and rags should ever be allowed to touch a bearing.
3. Grease must be clean. If there is the slightest doubt of its purity, it should be thrown away. Grease is cheap compared with bearings and lost man-hours.

Only a high grade of grease should be used for ball-bearing lubrication.

Inspection of Brushes

Brush inspection is important. The first essential requirement for the satisfactory operation of brushes is the free movement of the brushes in their holders. Uniform brush pressure also is necessary to assure equal current distribution. Adjustment of brush holders should be set so that the face of the holder is approximately ⅛ inch up from the commutator; any distance greater than ⅛ inch may cause brushes to wedge, resulting in chattering and excessive sparking.

It is essential that the correct grade of brush for a specific application be used. Recommendations as to the correct grade of brush should be obtained from the manufacturer of the welder only.

Broken brushes imply two possibilities: incorrect brush grade, or mechanical defects (such as unbalanced, rough, or eccentric commutator). To eliminate brush breakage, both factors should be corrected.

Check the brushes to make sure that they will not wear down too far before the next inspection. Keep extra sets of brushes available so that replacement can be made when needed. It is false economy to use brushes down to the absolute minimum length before replacement. Cases have been known where brushes have worn down until the metal, where the pigtail connects to the brush, was touching the commutator. This, of course, was causing damage to the commutator.

Make sure that each brush surface, in contact with the commutator, has the polished finish that indicates good contact, and that the polish covers all of the surface of the brush. When replacing a brush be sure to put it in the same brush holder and in its original position. It's a good idea to scratch a mark on one side of the brush when removing it, so that it will be replaced properly.

When installing new brushes, fit them carefully to the commutator. Sand only until the curve of the brushes is the same as that of the commutator. Be sure that the brush shunts (pigtails) are fas-

WHERE OTHERS FEAR to TREAD

BUCYRUS-MONIGHANS walk surely . . . over rough ground or soft. They side-step obstacles, waste no time getting from one digging position to the next. They can work close to the edge of the bank, with consequent increase in effective range. They walk "softly," cushioning down with an ease that means long life. Because of the exclusive "Rolling Cam," they walk efficiently throughout millions of yards of tough digging. Performance has proved them the type of dragline that can handle the high pressure production so essential in wartime. They are available with booms up to 250 feet and buckets up to 20 yards.

A WALKING ACTION *that lasts!*

BUCYRUS MONIGHAN

SOLD BY

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Amp.	Speed	Make	Connection Diagram	Application	Shop or Mill No.	Card No.
Type	Motor Voltage		Time or Duty Cycle		F.L. Amp.	Phase / Cycles

Serial No. Model No.	Publication No.	Mfr's Order No. Our Order No. Date of Order Cost	
BRUSHES No. Cat. No. Size Material Grade	COILS (Cat. or Spec. No.) Motor: Stator — Main, Comm., Comp.; Rotor — Coils, Bars, No. per set Generator: Field — Main, Comm., Comp.; Armature — Coils, Bars, No. per set		
BEARINGS Front End, Cat. No. Motor End, Cat. No.		User: Location:	

SERVICE RECORD

Date	Shop	Floor	Service (Tacking, etc)	Duty Factor	Tested Load	
					Volts	Amps

REPAIRS

Date	Condition	Due to	Repaired by	Cost

MAINTENANCE

Greased		Inspected		Cleaned	
Date	By	Date	By	Date	By

• Card records like this on every welder your company owns will save time and money. Recordings made after inspection and service indicate any welder requiring excessive expense, and causes can be corrected before an emergency occurs.

tened securely so that current will not overheat the brushes and brush holders.

Check the springs that hold the brushes against the commutator. Improper spring pressure may lead to commutator wear and excessive sparking. Excessive heating may have annealed the springs, in which case they should be replaced and the cause of heating corrected.

Inspect the commutator for color and condition. It should be clean, smooth, and glossy, with a color varying from straw to chocolate brown where the brushes ride on it. A bluish or reddish color indicates overheating of the commutator. Roughness of the commutator should be removed by sandpapering or stoning. Never use emery cloth or an emery stone. Use a "fine" stone or number 00 sandpaper unless the commutator is in bad condition, when the job may be started with a "coarse" stone and finished with "fine."

For this operation, press the stone or sandpaper against the commutator with moderate pressure with the motor running, and move it back and forth across the commutator surface. Use care not to come in contact with live parts. Be sure to keep the dust out of the machine.

If the commutator is very rough as evidenced by pronounced up and down vibration of the brushes, the armature should be taken out and the commutator turned down in a lathe. When this is done, it is usually necessary also to cut back the insulation between the commutator bars slightly. If the commutator is found to be dirty when the generator is inspected, it should be wiped clean with a piece of canvas or other cloth that is free from lint.

Never put oil on the commutator. Proper selection of brushes gives the commutator all the lubrication required to prevent excessive wear and to build up a good smooth operating glazed surface on the copper. The addition of oil results in the development of a high resistance film which may cause undue heating and rough brush action. The oil will also have a detrimental effect on the internal parts of the commutator.

Transformer Maintenance

The arc welding transformers of alternating-current welders require a minimum of maintenance, but this fact should not be allowed to result in neglect. On fan-cooled units, fans should be cleaned and lubricated about once a year. Windings should be blown out at least twice a year in very clean locations, and more often in dusty places. At the time of this periodic attention, all connections and coil supports should be checked for tightness. Manual current adjusting mechanisms should be lubricated often enough to prevent stiff operation of the handwheel or crank, making sure that a fairly high melting-point grease is uniformly distributed over the full length of screws and guides. On motor-operated controls, lubrication at more frequent intervals may be required, as evidenced by slowing down of the motor or noise from the gearing. This point should be checked at least three times a year, and more often if experience justifies it.

While most welding equipment is designed to stand up under unusually adverse operating conditions, some not infrequent circumstances will cause serious impairment if not complete interruptions of their service.

One bad practice, for example, is that of leaving weather-protecting tarpaulins thrown over machines in operation, in such a way as to interfere with the free passage of ventilating air into and out of the equipment. Cases are known where welders have been equipped with canvas flaps permanently installed on inlet and exhaust air openings, resulting in

severe overheating and very short equipment life.

Improper connection of extension leads for either the electrode or work terminals is not at all uncommon. This results in a high resistance circuit from welder to arc and return with resulting variations in welding current, particularly when the leads are moved so as to change the resistance of the connections. This is a frequent cause of complaints by welding operators that the heat is not steady. The remedy for this is to make sure that connections are kept tight, and that all connections are made with cables equipped with properly installed cable lugs or terminals. It is practically impossible to bolt or wedge untinned flexible cable to another conductor and secure a good low-resistance joint. Soldered or reliable solderless connectors or terminals should always be used.

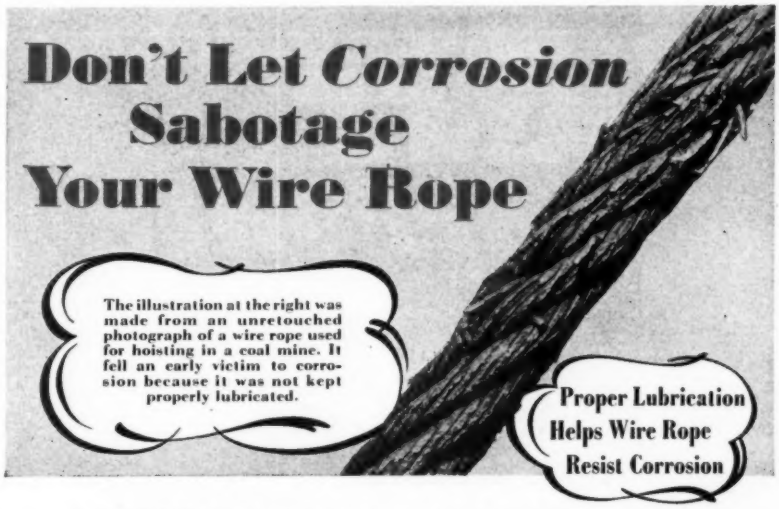
The use of excessively long electrode or work leads with motor-generator type welders will result in overheating of the motor when operating in the upper part of the current range unless extraordinarily large cables, or a number connected in parallel, are used. Overheating of the motor from this cause is a frequent reason for motor-generator welders tripping off the line with consequent loss of production.

Avoid Continued Short Circuits

A source of trouble which is not protected against by the motor overload relays is the intentional or unintentional application of long continued short circuits on the generator. Poor cable or cable connection insulation may be responsible for unintentionally short circuiting a generator for long periods of time. This results in the flow of very heavy generator current, but because of the low generator voltage involved, does not require sufficient power input from the line to cause the motor overload relay to trip. While the motor is not damaged, the generator may be seriously overheated or burned out. The same results will follow intentional permanent short circuiting of the electrode holder on the work or any grounded conductors.

The use of improperly bonded structural steel systems or building frameworks for the welding current return circuit is undesirable. The high resistance path thus afforded the welding current may result in overheating of the welder motor, and in addition, there is always the possibility that arcing or overheating of some poor connection, possibly quite remote from the scene of operations, may go unnoticed and start a fire.

No attempt should be made to adjust welding current output by any means other than those provided and recommended by the manufacturer of the equipment. Shifting the brushes on generators not designed for brush-shifting control will usually result in inferior welding characteristics, impaired commutation, and short brush life. Short circuiting of resistors or rheostats or any other tampering with the control furnished on arc welding equipment may result in damaging or burning out the equipment.


Don't Let Corrosion Sabotage Your Wire Rope
The illustration at the right was made from an unretouched photograph of a wire rope used for hoisting in a coal mine. It fell an early victim to corrosion because it was not kept properly lubricated.
Proper Lubrication Helps Wire Rope Resist Corrosion

CORROSION is an enemy saboteur that is constantly trying to destroy your wire rope. Unless combatted by proper lubrication, normal rope life is greatly shortened and a serious hazard to safety created.

Wire Rope is an intricate machine with many "bearings". If it is to give the full service of which it is actually capable, these points of contact—both externally and internally — must be kept correctly and adequately lubricated at all times.

The right kind of lubricant to use and the frequency with which it should be applied depends upon the conditions under which your rope is operating. When in doubt, we suggest you consult with an experienced wire rope manufacturer.

Now that steel is so urgently needed for so many implements of war, the more "work hours" you can get out of your wire ropes, the more steel you save for other vital purposes. So in all earnestness we repeat—*Don't let corrosion sabotage your wire rope.*

Important
An idle wire rope is more vulnerable to corrosion than one in use, so be sure to give your ropes the protection of a good lubricant when they are not in service.

A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.
NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street
SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.

Notes from the manufacturers

The Carver Pump Company, Muscatine, Iowa, announces a change in factory and main office location from Rock Island, Illinois, to Muscatine, Iowa. According to Roy J. Carver, president, the move was necessitated by a need for greatly increased plant capacity to meet both contractor and government demands.

The Hayward Company, New York, New York, regrets to announce the death of Harold C. Ryder, advertising and sales promotion manager who died unexpectedly on August 15, at the age of 49. Mr. Ryder entered the Hayward Company in 1907. He served as a member of the signal corps in France during World War I.

Worthington Pump and Machinery Corporation, Harrison, New Jersey, announces the appointment of R. J. Laidlaw to the position of manager of its Cleveland district office. Mr. Laidlaw, succeeding A. J. Klug has been connected with the organization in various capacities since 1919.

Sauerman Brothers, 522 S. Clinton Street, Chicago, Illinois, regrets to announce the death of William Robert Elden, the company representative in New York City, who died September 2, in a Teaneck, New Jersey, hospital at the age of 59. Mr. Elden joined Sauerman Brothers in 1921, and remained as chief engineer until 1939. In 1939, he opened an office in New York City to represent the company.

General Electric Company of Schenectady, New York, announces the retirement of Charles J. Spiegel, GE installation engineer on July 31, after 43 years service with the company. Mr. Spiegel has supervised installation of many hydro-electric generators, among the more important being the two at Niagara Falls and four at Muscle Shoals.

The Wellman Engineering Company, Cleveland, Ohio, was the recipient of the Army and Navy E award on August 13. The award came as a result of their speed and efficiency in constructing a series of dry dock cranes to be used in building warships.

R. G. LeTourneau, Inc. Peoria, Illinois, announces that Murray M. Baker of Peoria has been appointed to the newly created post of executive vice-president. He has been a director of the firm for the past four years.

The Barber-Greene Company, Aurora, Illinois, has been awarded the Army-Navy "E" on August 25 in recognition of exceptional performance on the production front.

The B. F. Goodrich Company, Akron, Ohio, announces that L. H. Chenoweth, manager of manufacturers' sales, has resumed his duties after serving with the War Production Board in Washington. The company also announces that W. E. Williams has been appointed chief clerk of the Akron district office. R. E. Lewis, sales correspondent in the Akron offices, has entered the U. S. Navy as a chief petty officer in the physical training program headed by Gene Tunney.

FOR BIGGER PAY-LOAD DIGGING

HAISS HI-POWER

THE HEAVIEST JAWS OF ANY BUCKET OF ITS KIND...

Giving it a bowl which will stand any amount of battering and still hold its shape...Chisel or Pick-Point Teeth.

Buckets in stock at New York, Philadelphia, Baltimore, Atlanta, Richmond, Charlotte and Los Angeles... *Write or wire for prices, delivery and catalog details.*

GEORGE HAISS MFG. CO., INC., 144th ST. & PARK AVE., NEW YORK

WHEN BIG MACHINES GO INTO ACTION on the Industrial Front—

ROGERS HEAVY DUTY Gooseneck Trailers

They are generally Moved on ROGERS TRAILERS

EXPERIENCE BUILDS 'EM
PERFORMANCE SELLS 'EM

ROGERS BROTHERS CORP.
135 Orchard St., Albion, Pa.

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

New trade literature

Title: Mining Directory of Minnesota—1942

Subject: The mining directory of Minnesota is published annually by the Mines Experiment Station, University of Minnesota. The directory consists of four parts. Part I contains maps showing the location of the mines and reserve properties list. In part II the mines are shown on the maps by name, the reserve properties are shown by letter and number. The known limits of the ore formation on the Mesabi range as well as the principal state and county highways are also shown. Part II shows pertinent information on all properties which have shipped ore, or are listed in the tax records as containing merchantable ore. Part III contains a list of all the operating companies and the major holding organizations that are identified with the Minnesota iron ranges, together with a complete list of the officials, subsidiary and affiliated companies. Part IV contains general statistics on the iron or ore industry and includes tables on reserve tonnages, shipments, ore docks, lake freighters, ore prices, freight rates, taxes, production costs, imports, exports, and foreign production.

Where to Get: University of Minnesota, Institute of Technology. Price $1.

Title: Procedure Handbook of Arc Welding Design and Practice

Subject: This book contains 1,308 pages and 1,810 illustrations, including photographs and drawings. Greatly enlarged, the 7th edition of the Procedure Handbook is illustrated more greatly than ever before. New and significant information is given in the new handbook on such subjects as welding symbols, new allowable stresses, preheating for welding, stress relieving, procedures and costs, general metallurgical characteristics of metals and alloys, appearance and styling of welded design and many others. The handbook is divided into eight sections.

Where to Get: The Lincoln Electric Company, Cleveland, Ohio. Price $1.50 in U. S., elsewhere $2.00 per copy.

Title: Model 12 Service Trencher

Subject: A four-page, two-color bulletin, describing the features and illustrating the uses of the Buckeye Model 12 trencher. Illustrations show the machine being used in the excavation of new pipe lines, drainage projects, municipal work and other ditching jobs.

Where to Get: Buckeye Traction Ditcher Company, Findlay, Ohio. Free upon request.

Title: Introduction to Highway Engineering

Subject: A text book for students of civil engineering and an introductory course in highway engineering. Emphasis has been placed on fundamental processes and the practice of highway engineering. Detailed description of laboratory procedures, test methods, manufacture of materials, the proportioning of concrete mixtures, surveying operations and the design of bridges have been avoided. The first chapter presents a brief historical background and concise descriptions of highway system and highway structure itself. The next five chapters deal with subjects which should proceed the study of highway surfaces. Details of the design, construction and maintenance of various highway types then are described. The changes in the fourth edition comprise a revision of much of the subject matter of the previous edition, the introduction of a considerable amount of new material and a slight rearrangement of the chapters.

Where to Get: John Wiley & Sons, Inc., New York. Price $4.

Title: "Shovel News"

Subject: Picturing news of activities and developments in the field of P & H excavators, the publication will be intermittently issued through the mail to excavator contractors and operators during 1942.

Where to Get: Harnischfeger Corporation, Milwaukee, Wisconsin. Free upon request.

Title: Coal Report—Illinois—1941

Subject: This book listing mines and product and classification by output, includes the complete and concise reports of state inspectors. The 60th annual report gives an excellent picture of coal mining operations during 1941.

Where to Get: Department of Mines and Minerals, Springfield, Illinois.

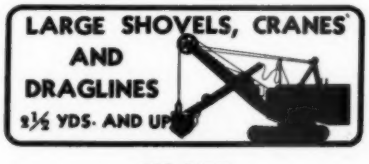
Title: Specifications for Asphalt Cements

Subject: An insert for the Asphalt Institute manual "Asphalt Pocket Reference For Highway Engineers" and other institutional construction specifications.

Where to Get: Asphalt Institute, 801 2nd Avenue, New York City. Free upon request.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.



FOR SALE

MARION MODEL 125 electric shovel, crawler mounted. 55' boom, 36' handle. 2½-yard bucket. For power supply 3 phase. 60 cycle. 2300 volts. **Box 2854**

BUCYRUS-MONIGHAN 4-W Diesel Dragline. 110' Boom. 4½-yd. Bucket. Reported good working condition. Some extra parts included. Located Georgia. **Box 2796**

BARGAIN

30-B BUCYRUS both shovel and dragline booms, Atlas Imperial Heavy Duty Diesel Motor, Electric light plant, two dragline buckets. Located on Canadian National Railway near Edmonton. P. O. Box 231, Edmonton, Alberta, Canada.

COAL STRIPPING UNIT

200-B BUCYRUS-ERIE steam stripper mounted on caterpillars. 75-ft. boom, 60-ft. sticks, 6-yd. capacity. This machine new 1936. 50-B rebuilt loader, steam power, 30-ft. boom, 22-ft. sticks, 2-yd. bucket. Sell or will lease to financially responsible parties. **Box 2910**

MARION 7200 Diesel powered walking dragline. 100-foot boom. 5 cu. yd. bucket. Only two years old. Located California. **Box 2906**

QUARRY SHOVELS

TWO 4-YARD full revolving electric quarry shovels. Now operating. Can be inspected. Available promptly. Midwest. Box 2913

STRIPPER AND LOADER

225-B BUCYRUS-ERIE steam stripper truck mounted, in excellent condition. 80-ft. boom, 54-ft. sticks, 6 or 8 yd. bucket. **50-B rebuilt** 2-yd. loader. Extra parts for both machines. Sell or lease to responsible parties.
Box 2911

A GOOD SHOVEL BUY

P&H 1-YD. shovel, model 450, serial 4399, excellent condition, immediate delivery. Clifford Waterhouse, Jackson, Miss. Tel. 2-0617.

GRADER & TRACTOR

Cat. 50-66 grader, hand control, 4 steel wheels, 12 ft. blade. Cat. 60 gas tractor, new track assembly. Intern'l TD40 Diesel tractor, wide gauge. This equipment is completely rebuilt, cleaned and painted, new upholstery and ready to go now. Clifford Waterhouse, Jackson, Miss. Tel. 2-0617.

FOR SALE—Used Bucyrus-Erie Model H-44 Scraper. Bargain Price. Condition excellent. Tires good. Inquire Box 2902.

One M-51 4½ yd. Bucyrus-Erie 4-Wheel Scraper, complete with 6—9:00x20 ten ply tires in good condition, and MV-15 Bucyrus-Erie single drum Winch and adaptor for use with TD-40 International TracTracTor.

One P-14 Winch for above Scraper for use with a TD-14 International TracTracTor.
Box 2903

TRENCHER

Barber-Greene Trenching Machine. Fred J. Hines, 2750 Monroe Ave., Rochester, New York.

EQUIPMENT FOR SALE

1—Railroad Steam Asphalt Plant, 1,000 lb. mixer
2—10,000 gallon Asphalt storage tanks
1—8,000 gallon Fuel Oil Tank
1—Buffalo-Springfield 3 wheel 12 ton steam roller
1—Iroquois Tandem 10 ton steam roller
1—Austin Western 8 ton gas roller
1—P&H ¾-yard steam clam
1—Bucyrus ¾-yard steam shovel and clam
1—Koehring Paver 10E
5,000 Lineal feet of 5 and 12 inch metal forms
Asphalt tool wagon and asphalt tools

BADGER CONSTRUCTION SO.
818 Railway Exch. Bldg., Milwaukee, Wis.

One 1½ cu. yd. Tisco rock shovel bucket $700. This bucket is 90% new. Rack pinions, shaft and gear included. Also dipper sticks. 441 Arctic St., Bridgeport, Conn. Phone 3-9086.

FOR SALE: 2 yard dipper with new front, new bail lugs, new side plates, and is in A1 condition. This is a heavy rock dipper complete with bail but without bail pins or tooth bases.
Box 2891

2 MODEL L A-C TRACTORS silent geared nigger-head winches; 27-E Rex Paver; Isaacson & Gar Wood Bulldozers; Cletrac 55 with Isacson Hydraulic bulldozer; 5 complete hydraulic dumps 2 and 2½ yards; 5 Hercules JXC Gas Motors; 2 Red Seal Continental motors; 1 Keystone ½ yard backhoe, can be used for stationary derrick, price $750; five forward speed transmissions—BrownLipe, Clark. Sols. 95 Flat Shoals Avenue, S.E., Atlanta, Ga.

CAT 60 TRACTOR, 3 EUCLID 6-yard and one Euclid 8-yard crawler mounted bottom dump wagons. Good condition. Industrial Salvage Mat'l Co., Milwaukee. Tel. Sheridan 0414.

4-TRACK TIPPLE

Complete 4-track coal tipple and siding, 40-car per day capacity. Bargain. Box 2912

AMERICAN DITCHER—7x8 machine for operation on flat car or standard gauge track. Equipped 43x91" submerged flue type boiler, hoisting drum 14x22¾", pull-in drum 14x22⅝", boom drum 10½x11" long. Machine in good condition, available immediately. Rib Lake Lumber Co., Rib Lake, Wis.

RUTH DREDGER H-L minus 60 h.p. Waukesha gasoline engine power plant. Purchased new 1929 and used about one year. Machine equipped with 50-foot extension and 17-bucket elevator. Main crawler 16'0" long. Track links 8" pitch, 40" long. Overall length of dredger 30'0". This type dredger is particularly adapted for cleaning, digging, enlarging drainage canals of not more than 40 feet in width. For sale by receiver. Any reasonable offer will be accepted. Location Florida east coast.
Box 2901

FOR SALE—Special Electric Tower Excavator equipped with grizzly and crusher for shaft and underground belt disposal. Head Tower on flanged wheels and rails, and arranged for full rotation. Tail tower on caterpillars for operation at 700' radius at any point within a circle. Electrical equipment 3 phase, 60 cycle, 2300 volts Ward-Leonard with 200 hp introduction motor. Box 2878

For Sale
Surplus Equipment

1—60 ft. dragline boom built for use with 43-B diesel Bucyrus shovel. Practically new.

1—Dragline bucket for use with above. Depth 34 in. Width 52 in. from cutting lip to back of rounded plate 60 inc. Good condition. Box 2896

WILL TRADE

Have Bucyrus-Erie Model S-108 equipped with 6—1200x20—14 ply tires in excellent condition. Will trade for Bucyrus-Erie model S-90 Scraper equipped with either 6—1100x20 or 6—1300x20 tires. Reply giving serial number, location and advise condition of tire equipment.
Box 2894

WANTED

COMPLETE SET FAIRLEADS for Bucyrus-Erie 15-B dragline. Write or wire.
Box 2905

WANTED: ⅝ to ¾ yard shovel. Also good used Caterpillar D4 or R4 with Athey Mobiloader attached. Give full description and price.

Z. E. Reese, Regent, North Dakota

WANTED

Equipment trailer to haul 20-B Bucyrus-Erie shovel. Must be equipped with pneumatic tires with or without platform. J. R. Simeone, 421 So. Dupont St., Wilmington, Del.

WANTED

Two P-24 winches with adaptors for TD-14 International. Also one S-67 Bucyrus-Erie Scraper. Box 2907

WANTED

In market for trencher that will make width of at least 12"; and Caterpillar with side-boom, back filler and other type equipment making one unit for pipe lines.

JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards (St. Clair County), Ill.

WANTED

32' boom and 22' dipper stick for quarry type No. 37 Marion electric shovel.
Box 2908

WANTED

TRACTRACTOR INTERNATIONAL TD-9 with angle dozer or bullgrader.

UNIVERSAL CRANE mounted on good heavy truck.

For use in Tennessee logging operations. Please write full particulars including price. Box 2909

FOR SALE

7—Hercules Standard Gas Engines—Model "WXC" 6 cylinders—4" bore x 4½" stroke
2—Hercules First Altitude Gas Engines—Model "WXC—3" 6 cylinders—4¼" bore x 4½" stroke.
4—Hercules Second Altitude Gas Engines—Model "WXC—3" 6 cylinders—4¼" bore x 4½" stroke.

All engines include carburetor, oil filtrator and mounting, governor manual control, fan assembly with belt and fan bracket, exhaust manifold, starting crank assembly, starter ring gear on flywheel for mounting electrical equipment, water thermostat, fuel pump with hand primer, magneto, spark plugs, set of wiring and miscellaneous tools.

Wire — Write — Telephone

BUCYRUS-ERIE COMPANY
Parts Department
SOUTH MILWAUKEE, WIS.

MACHINERY—MOTORS—CRUSHING PLANT EQUIPMENT

Belt Conveyors—Electric Screens, Elevators and Crushers
3—100KVA Transformers
15—Electric motors
Electric Pumping Equipment
65-ton Elec. American Hoist with Slewer Drilling Equipment
Dust Collector System
2, 3, 4, 5, and 6-inch Used Pipe
6-inch Used Railroad Spikes

Write for inventory and prices.

The Barjohn Corp., Mellen, Wis.